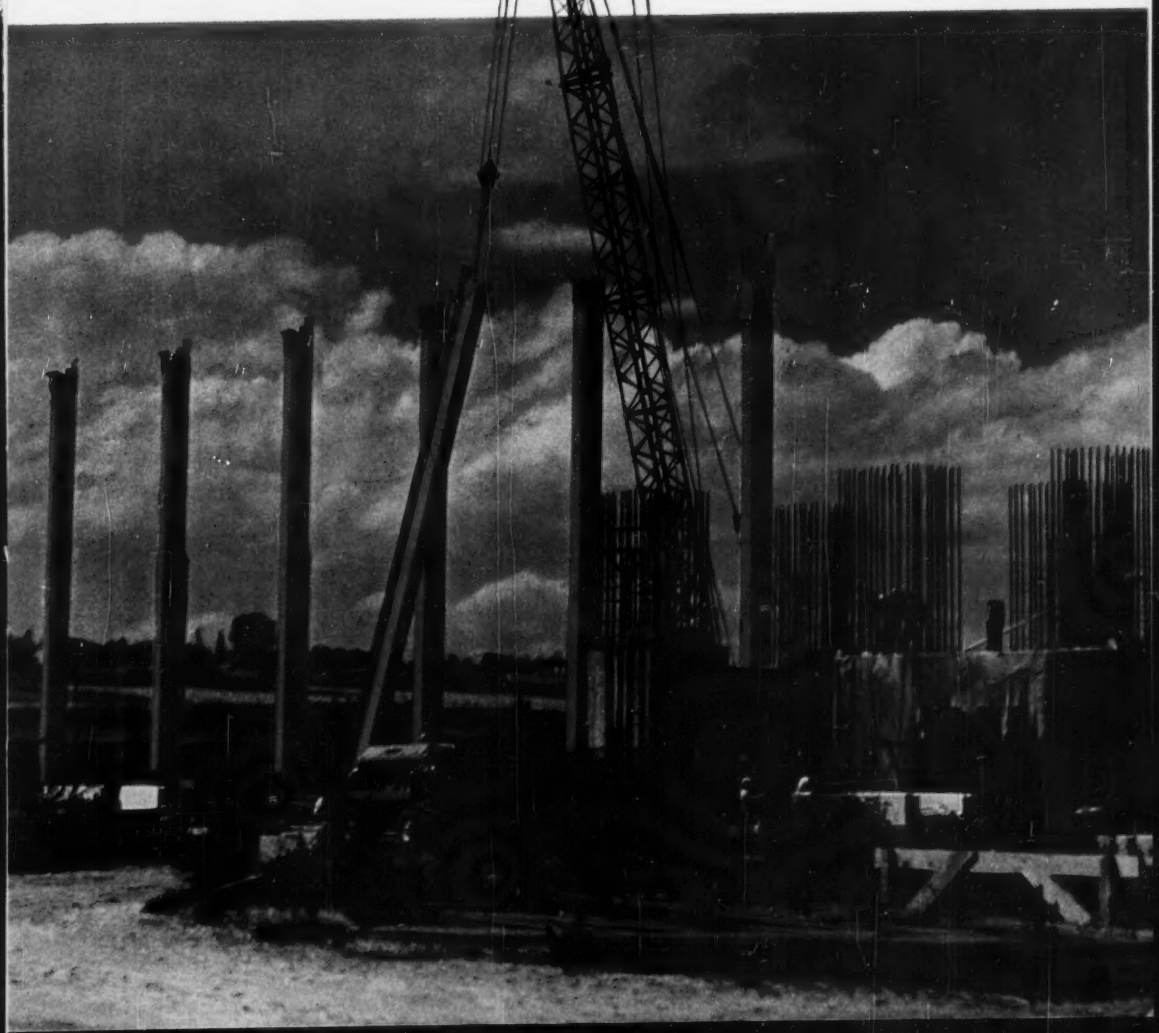
CONSTRUCTION METHODS AND EQUIPMENT

December, 1949



In this issue **Construction at Hungry Horse Dam**

A McGRAW-HILL PUBLICATION

EXTRA VALUE! AT NO EXTRA COST!

HI-BOND has *HIGHER* deformations than required by ASTM Specification A305

THE new Specification A305 of the American Society for Testing Materials gives architects and engineers a standard by which they are guaranteed a deformed reinforcing bar that will carry its share of the load in the structure. By specifying that reinforcing bars meet ASTM A305, they are assured of receiving bars with deformations having minimum heights, maximum spacing, and other characteristics which promote improved bond.

Inland HI-BOND bars not only meet but *beat* ASTM A305, for they have higher deformations and more closely spaced ribs than the specification requires. You get this plus value at no extra cost in *every* HI-BOND bar . . . for mill practice requires that test samples of HI-BOND be taken from production frequently and regularly. If, in this testing, it is found that the height of HI-BOND's reversed double-helical ribs has fallen below certain standards—standards well above the requirements of ASTM A305—the worn rolls are immediately replaced with new, deeply grooved rolls.

You obtain better interaction between concrete and steel when you specify ASTM A305 and you get plus value if you specify HI-BOND bars. By providing superior bonding strength—by anchoring *firmly* in the concrete—Inland HI-BOND bars prevent slipping, eliminate unsightly wide cracks, and permit more efficient and economical structures. Write for complete information.

Inland Steel Company, 38 S. Dearborn Street, Chicago, Illinois. Sales Offices: Chicago, Davenport, Detroit, Indianapolis, Kansas City, Milwaukee, New York, St. Louis, St. Paul.

INLAND

HI-BOND

Reg. U. S. Pat. Off.

The Reinforcing Bar with the "BUILT-IN" ANCHORAGE!

OTHER PRODUCTS: BARS • STRUCTURALS • PLATES • SHEETS • STRIP • TIN PLATE • FLOOR PLATE • PILING • RAILS • TRACK ACCESSORIES • PIG IRON

B.F.Goodrich

Why you get more recappable tires when you use B. F. Goodrich

IN TOUGH, off-the-road operations like that shown above, mileage doesn't mean much in measuring tire service. Instead, the yardstick is number of hours a tire works and whether or not worn treads can be recapped, or if sharp, jagged rocks cause serious tread cuts.

Reports from B. F. Goodrich users indicate top performance of BFG tires as compared with other brands. For example, one operator reported over 4,500 service hours from B. F. Goodrich *Universals* vs. only 1,600 hours from another make in identical service.

B. F. Goodrich tires stand out in service for many reasons. Tread rubber is specially compounded to resist cutting. More tires can be recapped because they have double bruise protection in the B. F. Goodrich *double nylon shock shield* . . . layers of nylon cord built in between the tread and the body plies.

Only BFG gives you the added protection of the nylon shock shield; the added savings of (1) longer tire life (2) increased bruise resistance (3) less danger of tread separation (4) more recappable tires. But nylon shock shield costs no extra — you pay no premium!

Another "special" is the new ALL-NYLON tire for tough construction projects, quarry work, strip mining, etc. In all tests, not a single BFG All-Nylon tire blew out, not one flex break occurred!

There's a specially designed off-the-road type B. F. Goodrich tire for every need. See your dealer or write, wire or phone — *The B.F.Goodrich Company, Akron, Ohio.*

take the "worry" out of winter!

Get the jump on winter with efficient Oliver snow removal equipment. Both Oliver "Cletrac" crawler tractors and Oliver Industrial wheel tractors and their full line of allied equipment can help you keep highways, streets and sidewalks clear of snow . . . keep traffic moving despite the heaviest snowfall.

And, an important cost-cutting advantage to you is the fact that these husky tractors are year-round units . . . snow plows and snow loaders in winter, earth-movers, loaders, shovels, pavement breakers, mowers, ditch diggers, etc., in other seasons. Why pay for a lot of specialized individual construction and maintenance equipment when Oliver and Oliver "Cletrac" tractors can do the job at far less cost.

If you already own Oliver Tractors, ask your Oliver Distributor about snow removal equipment designed for your tractors. If not, you'll find it pays to investigate the Oliver line today.

Cletrac

a product of

THE OLIVER CORPORATION

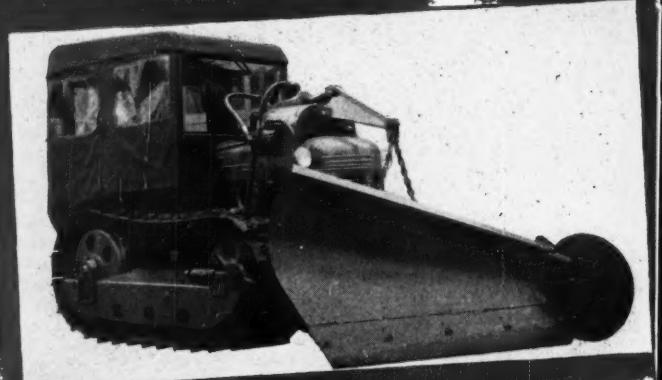
Industrial Division: 19300 Euclid Avenue, Cleveland 17, Ohio

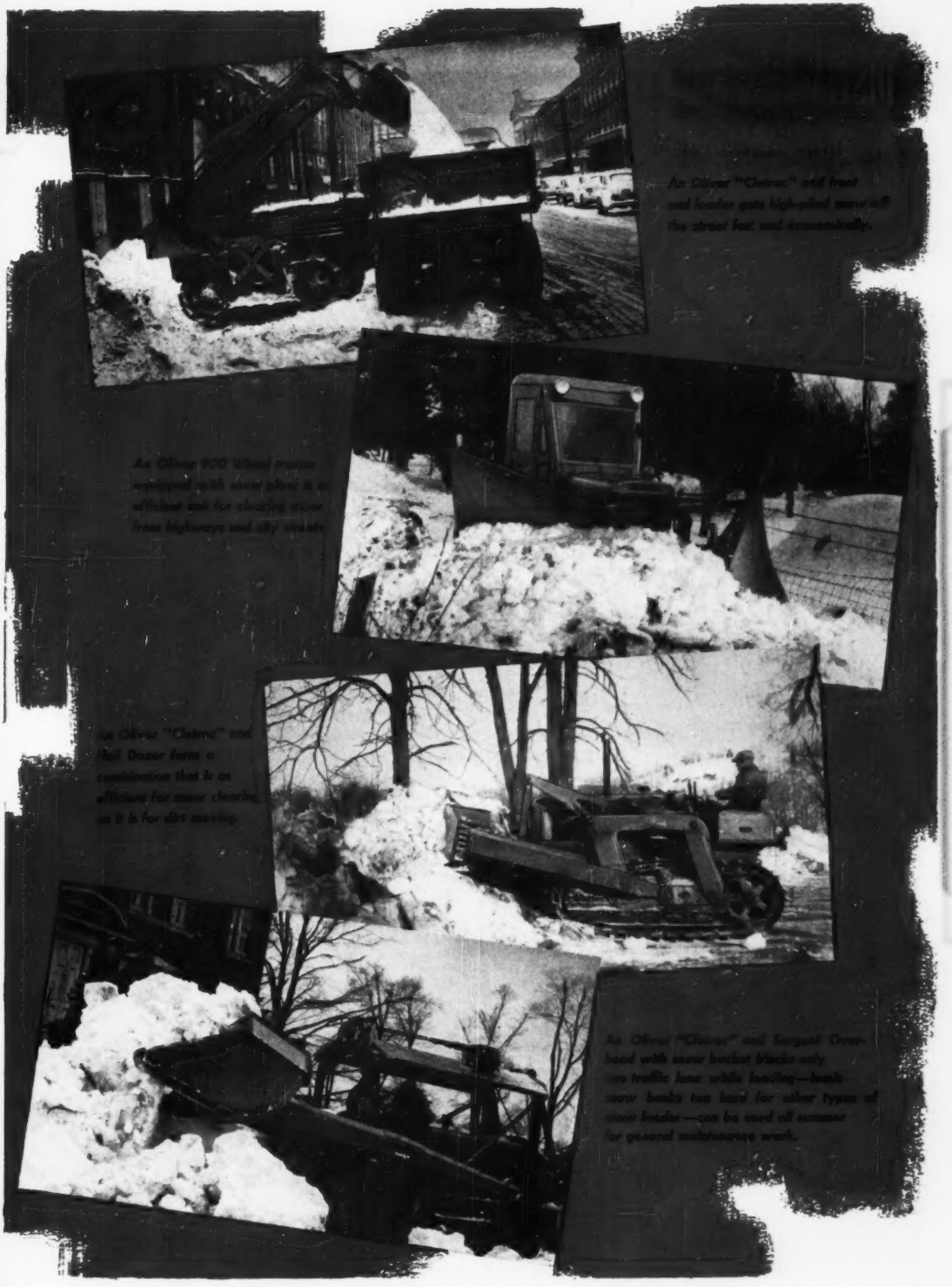
A complete line of crawler and industrial wheel tractors

OLIVER Cletrac SALES SERVICE

"The Sign of Extra Service"

For the best in clearing snow from sidewalks, driveways or side streets, an Oliver crawler tractor and sidewalk snow plow is the answer.





An Oliver "Clairvet" sand front end loader gets high-walled snow off the street fast and economically.

An Oliver 900 Wheel tractor equipped with snow plow is an efficient unit for clearing snow from highways and city streets.

An Oliver "Clairvet" and Hall Dozer form a combination that is as efficient for snow clearing as it is for dirt moving.

An Oliver "Clairvet" and Sargent Crawler with snow bucket blocks only one traffic lane while loading—hauls snow banks too hard for other types of snow loader—can be used all summer for general maintenance work.

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Quick-Acting, Universal
HOSE COUPLING

Comparison with similar couplings lies in general appearance, alone. Service-tested materials, precision manufacture and careful inspection assure unrivaled performance under all conditions. Malleable iron, cadmium plated, or bronze.

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Volume 31
Number 12

CONSTRUCTION
METHODS AND EQUIPMENT

ESTABLISHED
1919

DECEMBER 1949

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Miracle? No—It's KNOW-HOW!

CONCRETING better than a floor a day, it took just 65 working days to erect superstructures of the ten units, 7 and 8 stories high, for Eastchester Houses—New York City Housing Authority's 874-apartment project, 950,000 sq. ft. floor area, in the Bronx.

Miracle? No . . . *Know-How!* Dividing the job into its components and dovetailing them into a cycle, trained crews erect and strip column, beam and slab forms, set reinforcing, place and finish concrete. Nobody in anybody's way, each crew progressing cycle to cycle.

Line production that gets utmost economy out of 'Incor' 24-Hour Cement . . . a minimum of forms kept almost constantly in motion . . . dependable 'Incor'* high early strength to get you back on the cycle quicker, when delays occur.

High-efficiency operation like this keeps construction abreast, in values delivered, with any other industry in America, bar none!

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TIMETABLE OF ONE UNIT AT EASTCHESTER

A crew assembles column forms, then moves to next building.

Next crew erects beam forms—each crew trained in its own job.

Placing slab forms and layout for mechanical trades.

Setting reinforcing steel and installing pipe work.

Concreting second floor—other crews on respective cycles.

Concreting roof (9th floor)—84 floors in 65 working days!

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General Contractor: **CORBETTA CONSTRUCTION CO., INC.**
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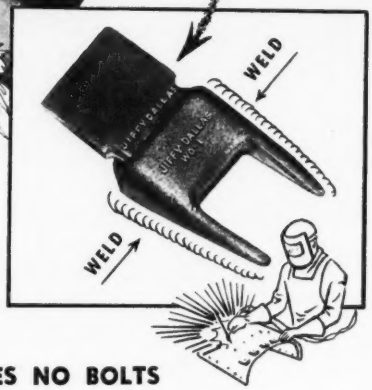

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This change-over standardizes your stock order to just one type of points for all equipment.

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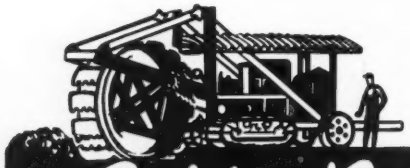
CHANGE your equipment to JIFFY SELF-SHARPENING REVERSIBLE POINTS. WELD-ON POCKET $1.50. JIFFY POINT 50c FOB—Dallas, Texas

"WO-1" pocket fits all trenchers except Barber-Greene. For Barber-Greene order "WO-2".

STOCK ON HAND . . . SEE YOUR DEALER or WRITE US.



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Phone Taylor 9567
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This Rear-Dump "Euc" meets the demand for a smaller capacity hauling unit for heavy off-the-highway service in mines, quarries, construction, and industrial work. It is engineered and built to the same rigid standards of design and construction as larger Rear-Dump Euclids — job proved for low cost hauling under the toughest operating conditions.

Powered by a 125 h.p. diesel engine, this new Euclid has a top speed with full payload of 35.4 m.p.h. . . . the transmission has ten forward and two reverse speeds. Spring mounted axles permit maximum travel speed on the haul road . . . a form fitting driver's seat mounted on hydraulic shock absorbers assures maximum riding comfort.

The simple design and rugged construction of the 10-ton Rear-Dump Euclid mean long life in heavy duty hauling and assure low maintenance and operating costs that result in greater job profits.

A Euclid Distributor will be glad to discuss your present or future job requirements and show how this 10-ton Rear-Dump Euclid gives trouble-free, efficient performance.

The EUCLID ROAD MACHINERY Co., Cleveland 17, Ohio
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EUCLIDS *Move the Earth*

THE NEW WALKER-TURNER . . . "900"

does these jobs

Ripping
Dadoing
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Bevel Ripping
Mitre Dadoing
Compound Mitering
Bevel Cross Cutting
Shaping
Routing
Tenoning
Grooving
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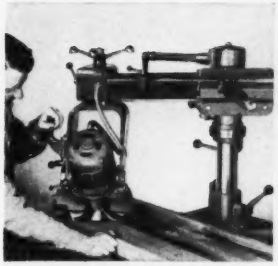
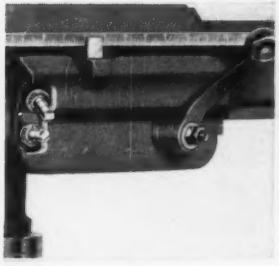
EASIER • BETTER AND FOR LESS MONEY

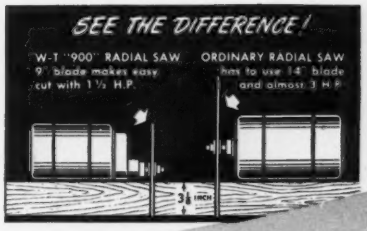
WALKER-TURNER RADIAL SAWS CUT DEEPER, CUT COSTS THROUGH INCREASED RIM FORCE

Increased rim force permits you to make a deeper cut with less expenditure of power because a 9″ blade and 1½ h.p. motor on a Walker-Turner Radial Saw does the same amount of work that ordinary saws can do only with a 14″ blade and a 3 h.p. motor.

Here's how it works. Unusual Walker-Turner motor construction brings the spindle (shaft) close to work through new type of positive cog belt and gear drive. A smaller blade is therefore used to do the required work, thus giving you a double saving. Smaller blades are less expensive than larger ones, less power is needed to turn them.






SEE THE DIFFERENCE!
W-T "900" RADIAL SAW
9" blade makes easy cut with 1½ H.P.
ORDINARY RADIAL SAW
has to use 14" blade and almost 3 H.P.
3¼ INCH

B

A

FULL WORK VISIBILITY

Full work visibility—motor yoke attached to gliding ram leaves work area free of obstructing, overhanging rack. No bending, bumping, dodging.

B

BALL BEARING RAM

Ball bearing ram—travels 24" on eight correctly spaced ball-bearings. Precision adjustment can be made without disturbing setting.

CENTER-PIVOT

Center-Pivot—all cuts start from the center of table. Full length left hand miters can be made as easily as right hand miters. Difficult cuts made easy with exclusive Center-Pivot construction.

CONTROLS

Controls—on-off push button switch at head of gliding ram; switch for quick voltage change for 110 or 220; elevating crank located where it's easy to watch exact blade height; three self-indexing, taper-seat latches at 45° and 90°, with positive locks.

ADJUSTMENTS

Adjustments—only three main points of adjustment: the work table, column guides; motor plate.

MOTOR

Motor—Specially designed, cool operating and powerful motor has 2½ times overload capacity.

PROTECTION

Protection—New type guard with anti-kick-back pawls and splitter for ripping. Extra protection in the drop leaf side guards.

TABLE TOP

Table Top—laminated maple, of selected hard kiln-dried stock 46" x 24", and 1" thick. Two fences; center one removable.

ASK FOR LITERATURE AND THE NAME OF YOUR NEAREST DEALER.

walker-Turner

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Chevrolet's power-packed VALVE-IN-HEAD ENGINES provide improved durability and efficiency as well as their world-famous economy.

Chevrolet trucks have the famous CAB THAT "BREATHES"*! Outside air is drawn in and used air forced out! Heated in cold weather.

Chevrolet Advance-Design brings you the FLEXI-MOUNTED CAB, cushioned on rubber against road shocks, torsion and vibration.

Chevrolet's SPLINED REAR AXLE HUB CONNECTION adds greater strength and durability to heavy-duty models.

Uniweld, all-steel Cab Construction • Large, Durable, Fully-Adjustable Seat • All-Round Visibility with Rear-Corner Windows* • Heavier Springs • Super-Strength Frames • Full-Floating Hypoid Rear Axle in the 3600 Series and Heavier Duty Models • Double-Articulated Brake Shoe Linkage • Hydrovac Power Brakes in Series 5000 and 6000 Models • Many Color Options.

**Heating and ventilating system and rear-corner windows with de luxe equipment optional at extra cost.*

CHOOSE CHEVROLET TRUCKS FOR TRANSPORTATION UNLIMITED!

No other Truck Crane like this!

Here's a combination of advantages that puts the Northwest Truck Crane far ahead of the ordinary rig. The High-Speed Power Controlled Boom Hoist, independent of all other operations; Uniform Pressure Swing Clutches that take the jerks and grabs out of swinging; the Northwest "Feather-Touch" Clutch Control that assures ease of operation without delicate complicated mechanism; Cast Steel Machinery Side Frames that maintain shaft alignment and reduce wear and tear; easy upkeep and plenty of power. These, plus the many other Northwest features proved in years of service assure smoother operation and higher output.

No other Crane Carrier like this!

The heavy duty carrier supplied with Northwest Truck Cranes is different! Designed by Northwest it brings you a box type frame braced and reinforced the full length as no other Truck Crane Carrier Frame is braced. Improved design has resulted in the better distribution of loads over the frame. Outriggers extend the full width of the Carrier and have considerable more bearing support when extended. Better positioning of outriggers relieves the Carrier of a great amount of stress when crane is operating.

The rear outrigger trunk is quickly detachable and makes easier conversion from Crane to Shovel. Dragline or Pull-shovel without repositioning the lower base.

The Northwest Truck Crane is the greatest advancement in equipment of this kind yet offered the Contractor. We would like to tell you more about it. Don't buy a Truck Crane before you get full details on this outstanding piece of Northwest Equipment.

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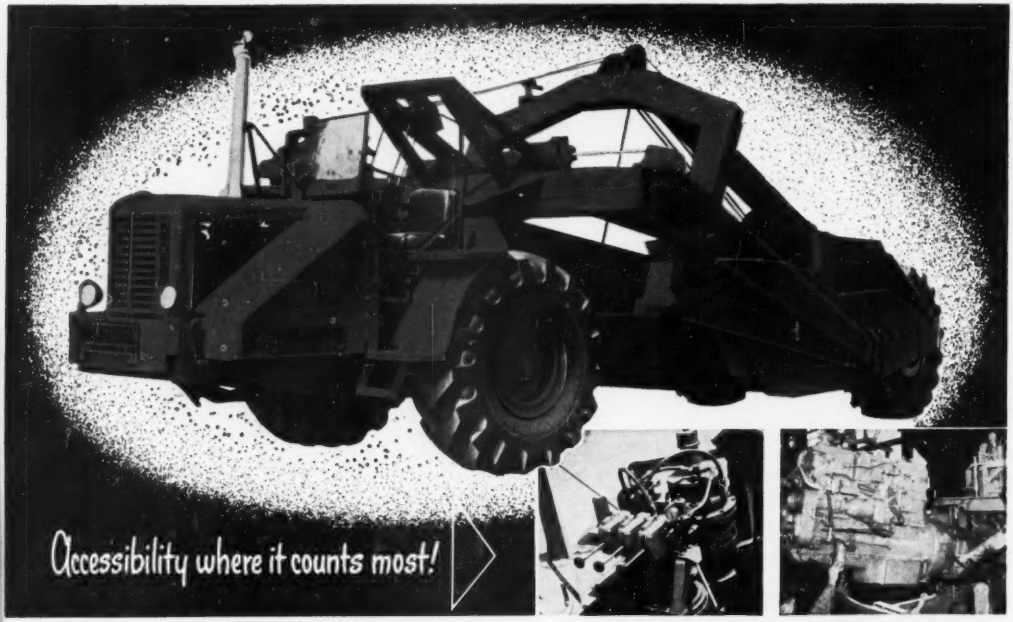
MAKE YOUR KEY MACHINE A REAL ROCK SHOVEL PROFIT

NORTHWEST

CRAWLER and TRUCK MOUNTED SHOVELS-CRANES-DRAGLINES-PULLSHOVELS

EASIER MAINTENANCE *is a vital part of* Terra Cobra PERFORMANCE LEADERSHIP



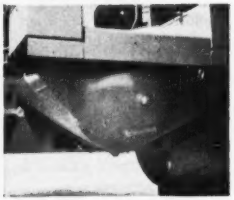
CABLES always accessible. Straight reeving, fewer sheaves, all away from dirt. Result: Longer cable life, less "down time."

POWER CONTROL UNIT easily adjusted from outside without special tools. Entire assembly removable without disturbing other units.

DEPENDABLE CUMMINS DIESEL ENGINE requires minimum maintenance, easily inspected or removed. Fuel, lube and air filters readily accessible.

Where a few minutes of "down time" can quickly eat up the profits, rugged dependability and *simplified maintenance* are essential in earth-moving equipment. That's why reserve strength *and accessibility* have been engineered into every feature of the Wooldridge Terra Cobra. Every major component can be easily reached or removed without disturbing unrelated parts. Cost-wise contractors have proved that this means *less* servicing, *faster* maintenance, *more* productive time, *higher* profits. Ask your Wooldridge distributor for complete details—or write today for Bulletin No. TC-705.

RUGGED TRANSMISSION may be inspected or removed without disturbing engine, differential or other major units.



MASSIVE DIFFERENTIAL accessible at all times. May be removed in a matter of minutes without affecting transmission.

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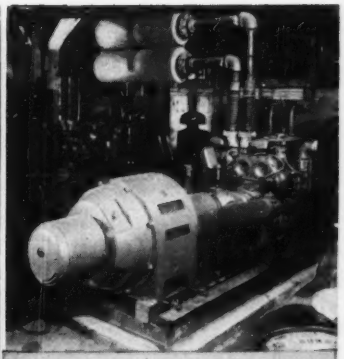
WOOLDRIDGE
EARTH MOVING EQUIPMENT

PROVED AND APPROVED FOR EVERY TYPE OF EARTH-MOVING JOB

The 200-ft. rolled earth Downsville Dam will stretch across a half-mile-wide valley of the east branch of the Delaware River. View shows core wall under construction by Walsh-Perini, who also have the contract for 25-mile diversion tunnel.



Two GM Diesel Twins drive 200 kw. standby electric generators providing emergency power for pumps and compressors.

Doing Every Kind of Job

at Downsville Dam

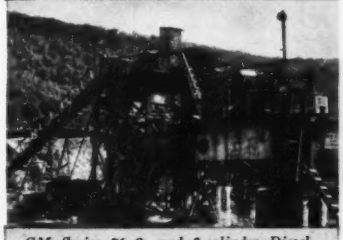
A fleet of GM Diesel-powered Euclids is used at Downsville by Walsh-Perini, and by White Oak Excavators, Inc. on highway relocation.

On big construction projects everywhere, you'll find an ever-growing number of General Motors Diesels taking over more and more of the tough jobs.

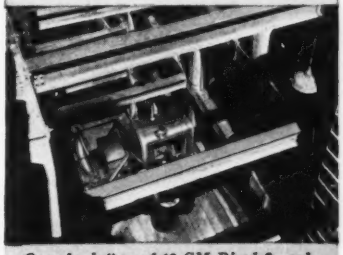
Shown here are some of the many different jobs these rugged 2-cycle Diesels are doing on Downsville Dam and the $44 million tunnel to carry water toward New York City. Contractors Walsh Construction Co. and B. Perini and Sons, New York, and others on this project, rely on GM Series 71 Diesels because they start fast, pinch pennies on fuel and stay on their feet with little attention.

If you are interested in dependable power at the lowest cost per horsepower, it will pay you to check the records GM Diesels are making. Write for complete information.

GM Diesel replaced the original power in this crane, shown placing rock on inlet channel wall.



GM Series 71 2- and 3-cylinder Diesel engines power screens and conveyors on gravel-washing plant of sub-contractor, Cooney Bros.



One of a battery of 13 GM Diesel 3- and 4-cylinder engines used by Walsh-Perini to power water pumps.

DETROIT DIESEL ENGINE DIVISION

SINGLE ENGINES... Up to 200 H.P. **DETROIT 28, MICHIGAN** MULTIPLE UNITS... Up to 800 H.P.

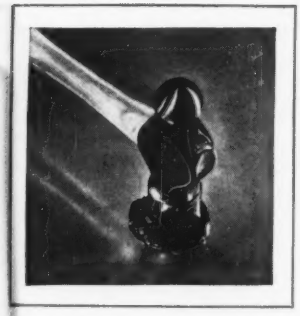
GENERAL MOTORS

DIESEL BRAWN WITHOUT THE BULK

GM GENERAL MOTORS DIESEL POWER

This test "Hammers Home" the fact that...

Maintenance Costs Less



HIT IT HARD! *Marfak* won't splatter like ordinary grease—proof that heavy loads and rough roads won't hammer it out of spring shackles, tie rods and other chassis parts... proof that *Marfak* gives safer, longer-lasting protection with fewer applications.

Because Texaco Marfak won't assures longer

HAMMERING jolts . . . heavy loads . . . road splash—you can protect your chassis bearings against all of them by using *Texaco Marfak.* It's the world's most famous chassis lubricant. *Texaco Marfak* guards bearings against dirt, rust and wear for extra hundreds of miles . . . assures longer life for chassis parts . . . reduces maintenance costs.

To give wheel bearings the same protection, use *Texaco Marfak Heavy Duty.* It seals itself in, assuring safer brak-

ALREADY SOLD—

TEXACO STAR THEATRE presents MILTON BERLE on television every Tuesday night. METROPOLITAN OPERA broadcasts every Saturday afternoon.

TEXACO

TEXACO

jolt or squeeze out of bearings . . . life for all chassis parts.

ing . . . seals out dirt and moisture . . . rustproofs the bearing metal. No seasonal change is required.

Let a Texaco Lubrication Engineer help you simplify your lubrication procedures . . . get greater efficiency, lower maintenance costs. Just call the nearest of the more than 2300 Texaco Wholesale Distributing Plants in the 48 States, or write The Texas Company, 135 East 42nd Street, New York 17, N. Y.

More than 300 Million Pounds of Texaco Marfak!

BETTER PROTECTION FOR CRAWLER TRACK MECHANISMS

Lubricate with *Texaco Track Roll Lubricant*. It gives full, long-lasting protection . . . effectively seals out dirt and water . . . reduces wear. It's easy to apply . . . economical to use. *Texaco Track Roll Lubricant* assures lower maintenance costs . . . keeps your machines on the job.

Lubricants and Fuels

FOR ALL CONTRACTORS' EQUIPMENT

DIGGING "IN THE DRY" CORALVILLE DAM, IOWA RIVER, IOWA

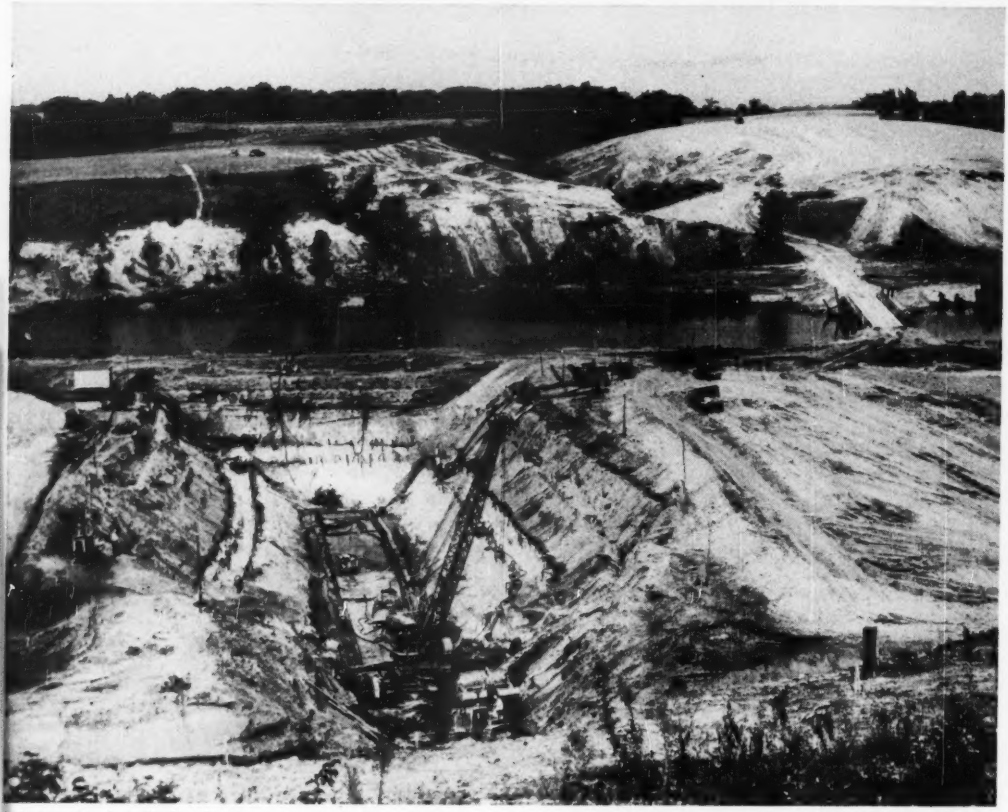


Photo courtesy Iowa City Press-Citizen

MORETRENCH IS THE LOW-COST WAY TO SOLVE A PUMPING PROBLEM

MORETRENCH WELLPOINTS, installed to rock, controlled 41 feet of water on this excavation for the cut-off wall for Coralville Dam. Material — sand, loam, clay and gravel. Rock at subgrade.

E. M. Duesenberg, Inc., Clear Lake, Iowa, contractor, made rapid progress— free of excessive pumping costs.

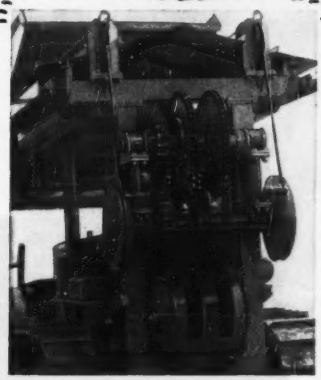
MORETRENCH CORPORATION

90 West St. New York 6 | 4900 S. Austin Ave. Chicago 38, Illinois | 7701 Interbay Blvd. Tampa 9, Florida | 315 W. 25th St. Houston 8, Texas | Rockaway New Jersey

Cut Deep INTO LOADING COSTS

with

THE AUSTIN OVERSHOT LOADER!



Powerful, MECHANICAL drive. Multi-web chain wraps on two hubs, creating a variable speed — maximum power at the digging position, changing to speed as bucket is raised.

In one straight-line operation, this high-production low-cost loader digs, cleans, hauls, and dumps MORE BITES PER MINUTE than equipment of equal bucket capacity. Yes . . . 3 to 5 completed passes per minute for the 1½ and 2½ cubic yard (rated capacity) models!

No side swings. Brings big-capacity loading into tunnels, excavations and other tight spots where formerly only low-capacity, less efficient equipment could move.

MECHANICALLY OPERATED. Designed and built "dozer strong" by practical contractors who know the service demands. Take the punishment of toughest boulder and slab mucking with minimum maintenance and down time.

- **One man operation, one lever control.**
- **Operates on any late model crawler-type tractor.**
- **Special attachments install in a few minutes. Include dozer blade; special buckets for snow, coal, beets, etc.; forks for timber.**
- **Three models, for 1½, 2½ and 4 cu. yd. buckets.**

"LONG JOHN" AUSTIN—holder of many world records for tunnel driving—knows what you want in loader speed, rugged stamina, versatility, and efficiency. The loader which bears his name will cut deep into loading costs—help you, too, bust records!

WRITE FOR SPECIFICATIONS AND COMPLETE DETAILS

JOHN AUSTIN, INC.

LONGMONT, COLORADO

GMCs "Deliver the Goods"

Food, furniture and fuel oil... the tree, the turkey and the toys... almost everything that moves by motor truck makes its contribution toward a Merry Christmas.

Total truck tonnage has increased 120 percent in the past ten years and GMC has been a pacemaker in this rapid rise in truck transportation. Now better equipped to "deliver the goods" than ever before, tough, truck-built GMCs offer powerful, valve-in-head gasoline engines or famed, 2-cycle Diesel models . . . strong, sturdy chassis with rugged axles, springs and brakes . . . big, wide-vision, easy-riding cabs . . . outstanding performance and dependability, unexcelled efficiency and economy.

There's a better-built GMC for all hauling jobs . . . for every transportation task . . . Christmas time and all the time!

GMC TRUCK & COACH DIVISION • GENERAL MOTORS CORPORATION

GMC
GASOLINE · DIESEL
TRUCKS

New construction is a "Christmas present" for the entire nation. GMC's complete line, ranging from Pickups to big brutes of over 90,000 pounds GCW, is completely capable of performing every hauling job in the construction industry.

SO FRICTIONLESS

—that even a sensitive stethoscope can't detect the slightest scratching of your fingernail!

CHRYSLER SUPERFINISH

. . . the Chrysler-developed method of surface finishing vital engine parts, *comes closer to eliminating friction and wear than any finishing method ever devised!*

Superfinishing removes the surface roughness left by machining. It produces an almost unbelievable mirror smoothness—far beyond the limits of grinding, honing or lapping. What is left is actually *polished base metal.*

Superfinished parts fit closer. They wear longer. They perform better. They prevent excessive loosening and surface scratching which causes loss of power and efficiency. That means greater utilization of the advantages that come from higher speeds and higher compression ratios.

All friction surfaces in Chrysler Industrial Engines are superfinished. And there you have one of the big reasons why Chrysler Industrial Engines are out-performing, out-lasting and out-economizing similarly rated engines on all sorts of jobs everywhere.

It pays to power and re-power with a Chrysler. See your Chrysler Industrial Engine Dealer or write us. Parts and service quickly available. ***Industrial Engine Division, Chrysler Corporation, Detroit 31, Mich.***

CHRYSLER

Industrial Engines and Power Units

HORSEPOWER WITH A PEDIGREE

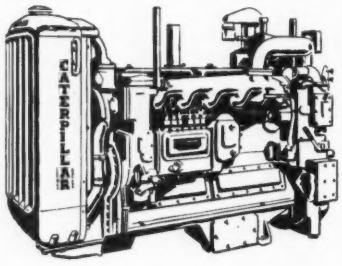
"CATERPILLAR" MOTOR GRADERS

HIGH PRODUCTION . . . calls for the balanced design and matched performance of an all-"Caterpillar" Motor Grader.

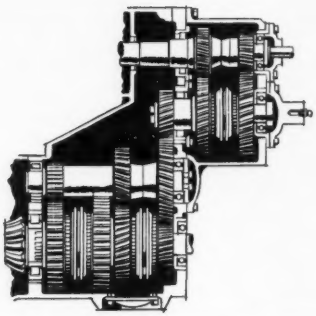
PRECISION BLADING . . . calls for the balanced design and matched performance of an all-"Caterpillar" Motor Grader.

•

Standard "Caterpillar" Diesel Motor Graders are priced as follows: No. 12, $10,920; No. 112, $9545; No. 212, $6435, all prices f.o.b. Peoria, Illinois, subject to change without notice.



ENGINE. The sturdy, dependable, heavy-duty all-"Caterpillar"-built No. 12 Motor Grader Diesel Engine is designed to function as a unit with all other parts of the machine. It has ample speed-and-power to give peak performance—plus ruggedness to meet the gruelling requirements of motor grader operation. Solid aluminum alloy main and connecting rod bearings are important reasons why these engines are so long-lived.



TRANSMISSION. The "Caterpillar" No. 12 Motor Grader transmission is a ***constant-mesh helical gear transmission*** specially designed and fitted to heavy-duty motor grader use. Yet it shifts with "pleasure car" ease. This, combined with great inherent strength, adds to production ability and motor grader life. Typical of "Caterpillar" quality is the independent gear-type lubricating oil pump which keeps every transmission gear bathed in a full supply of filtered oil.

ARE *BUILT*—NOT "ASSEMBLED"

Every "Cat" Diesel Motor Grader is *"Caterpillar"-built through and through* —from front wheels to rear—from complete engine to transmission to final drive. All mechanical parts are designed and fitted together for matched performance, correct balance, proper weight distribution, and long life. "Caterpillar" design, engineering and construction are all aimed at helping you get the utmost out of your motor grader investment. The records prove it . . . 99% of all "Caterpillar" Motor Graders ever built are *still on the job!*

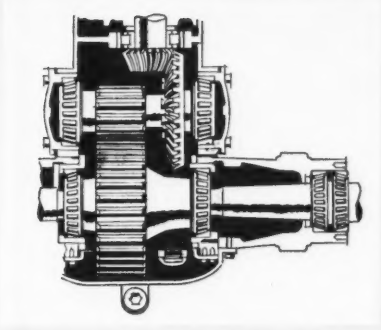
Your "Caterpillar" dealer can give you plenty of additional facts and figures. Meantime, write for new booklet, " 'Cat' Motor Graders Do the Job."

CATERPILLAR TRACTOR CO. • PEORIA, ILLINOIS

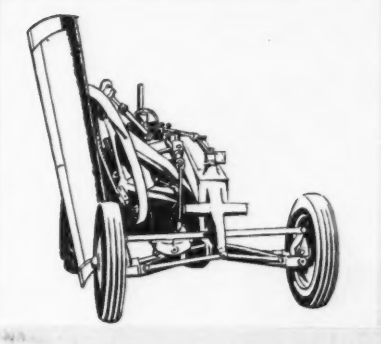
CATERPILLAR

REG. U. S. PAT. OFF.

DIESEL ENGINES • TRACTORS • MOTOR GRADERS • EARTHMOVING EQUIPMENT



FINAL DRIVE. Heavy-duty engine and transmission require rugged but simple final drive system to keep the motor grader at top working efficiency. Engine horsepower is converted into maximum tractive effort and earthmoving volume through this simple, sturdy system. Tapered bearings throughout keep friction losses at a minimum.

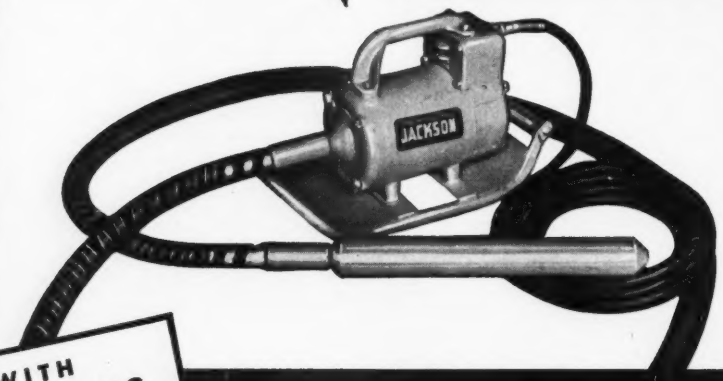


BLADE MECHANISM. The "Caterpillar" Motor Grader frame and blade system fully matches the sturdy in-built quality of the "Cat" Diesel Engine, transmission and final drive. Blade working positions like the one shown here can be made by the operator without leaving his position at the wheel. Mechanical powered controls are unaffected by temperature changes.

Announcing: THE NEW JACKSON ELECTRIC

MODEL FS-150A

FLEXIBLE-SHAFT CONCRETE VIBRATOR



WITH EVERYTHING the GENERAL CONTRACTOR COULD WANT

POWER GALORE: 2½ HP (continuous duty rating) Universal Motor provides more than ample power for uninterrupted placing of the stiffest mixes using the maximum length of shaft.

LIGHT SOCKET OPERATION: Wherever either 115 volt, 60 cycle single phase AC or Direct Current is available this relatively inexpensive vibrator will do a bang-up job of concrete placement.

HIGH FREQUENCY — 3 VIBRATOR HEADS: 8,000 to 10,000 VPM and availability of three vibrator heads assure rapid as well as thorough consolidation of the stiffest mix concrete under all conditions.

28 FOOT REACH: Available with any length of shaft up to 28 feet. Maximum length makes hard-to-get-to places readily accessible — saves time by making frequent changes of vibrator location.

CONVENIENT - RUGGED CONSTRUCTION: Double grip, skid-base handle with finger tip control switch. Weighs only 50 lbs. Finest, smooth-running flexible shaft and fittings — built to take the most severe usage.

GRINDING: Countershaft attachment for quick conversion to wet or dry concrete rubbing.

See this outstanding general-purpose electric vibrator at your Jackson Distributor or write for complete facts.

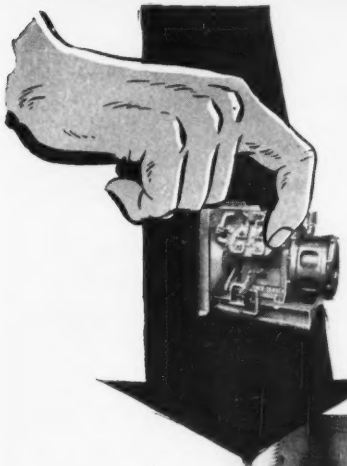
Write for

your free copy of the Jackson "POCKET GUIDE" to the best vibratory equipment for every type of concrete placement — Soil Compaction — Portable Power Plants.

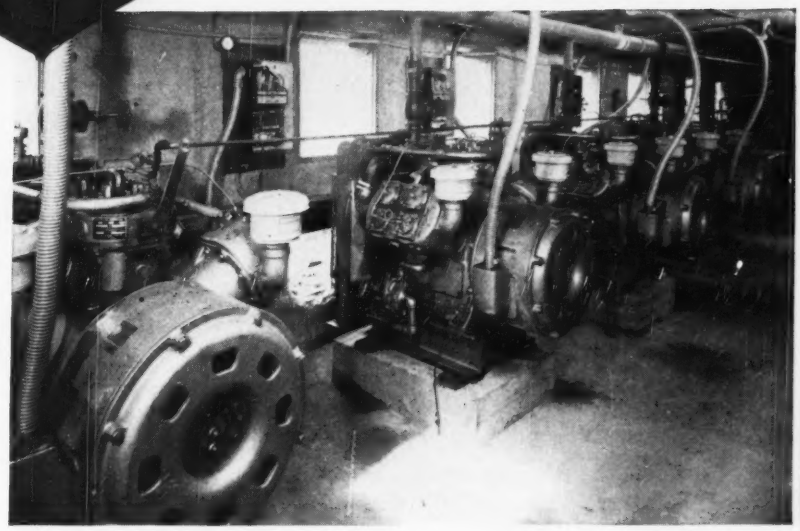
ELECTRIC TAMPER & EQUIPMENT CO.

LUDINGTON, MICHIGAN

"Move in" with 1,000 2,000 3,000 feet of air



. . . anywhere . . . at lower cost!



Gardner-Denver WB Two-Stage, Water-Cooled Compressors are available in capacities from 150 to 700 cubic feet displacement per minute — may be furnished with electric motor, diesel or gasoline engine drive.

HERE'S how you can get off to a fast start — have 1000 - 2000 - 3000 cubic feet of air on tap days ahead of schedule. Install Gardner-Denver WB Compressors in multiple units, as shown here.

These compact, "packaged" compressors come ready to install — require no special foundation — no water piping — no external water-cooling devices. Because of these savings, the total investment for such a multiple unit WB installation is unusually low.

And remember, smooth-running two-stage WB Compressors — with balanced construction and self-contained cooling system — are famous for long life and low-cost operation. Write today for illustrated bulletins.

GARDNER-DENVER Since 1859

Gardner-Denver Company, Quincy, Illinois

In Canada: Gardner-Denver Company (Canada) Ltd., Toronto, Ontario

No "growing pains" for this young fleet

● The five new DIVCO units shown above were put in operation recently by the Billings Laundry Company, Billings, Montana. This young fleet has passed through the important initiation period and into full-fledged operation with flying colors.

Effective lubrication by STANOLUBE HD Motor Oil kept the engines in excellent condition throughout the critical break-in period, and has helped the new fleet move into severe start-stop service *without any maintenance troubles.*

Fleet operators throughout the Midwest have discovered the benefits of starting new units on STANOLUBE HD. In new engines, STANOLUBE HD stands up under high temperatures and thus does not form harmful oil deposits. It maintains strong films of oil between tightly fitted rubbing surfaces—which prevents any scuffing or scoring of engine parts. Its detergent-dispersant action keeps contaminants harmlessly dispersed within the oil until they are removed at regular drain periods.

The same STANOLUBE HD qualities that protect engines during break-in operation also reduce maintenance trouble and expense in any type of fleet service. A trial in your fleet engines will prove it. A Standard Oil Automotive Engineer will help you make the most effective use of STANOLUBE HD Motor Oil. Your letter will obtain his services.

Write Standard Oil Company (Indiana), 910 South Michigan Avenue, Chicago 80, Illinois.

Stanolube HD Motor Oil

STANDARD OIL COMPANY (INDIANA) STANDARD

McCULLOCH *presents* THE

SAWING SENSATION OF THE YEAR

★ 3 hp McCulloch die-cast gasoline engine
★ Less than 25 lbs. complete with 18" blade and chain
★ Pistol grip handle, trigger type throttle
★ All engine controls grouped for one-hand operation
★ Automatic Clutch stops chain when engine idles
★ Kickproof automatic rewind starter
★ Ignition points accessible for easy adjustment
★ Floatless carburetor permits sawing in any position
★ Built-in chain oiler

McCULLOCH CHAIN SAWS

THERE'S A McCULLOCH CHAIN SAW for every wood-cutting purpose

MODEL 3-25 ★ 18-inch blade—$295.00
24-inch blade—$305.00 • 14-inch bow — $315.00

MODEL 5-49 ★ 5 hp high production series available with 20, 30, 40, 50, 60-inch blades and with 20-inch bow.

A 25-POUND ONE-MAN WONDER

Every outstanding feature of the larger McCulloch Chain Saws is in the new, *truly one-man,* Model 3-25. Besides, all the experience gained in building the others has been carefully embodied in this great new chain saw achievement. The Model 3-25 answers the long standing demand for the *lightest possible* unit combined with dependability and high performance.

Check the features—see the Model 3-25 now on display—give it every test in the book, and you'll agree that it's your winning number.

SEND COUPON FOR NEW DATA SHEET AND COMPLETE SPECIFICATIONS

MANUFACTURED BY
McCULLOCH MOTORS CORPORATION
6101 West Century Blvd. • Los Angeles 45, Calif.
NATIONWIDE SALES AND SERVICE

McCULLOCH MOTORS CORPORATION MC
6101 West Century Blvd., Los Angeles 45, Calif.

Please send me immediately information on the NEW Model 3-25 McCulloch chain saw and name of nearest dealer.

Name_____

Address_____

City_____ Zone____ State_____

One of four concrete bridges built for the new road. Bethlehem supplied the reinforcing steel.

Road Construction Near Lancaster, Pa.

Approximately five miles of Pennsylvania's Route 23, popular highway carrying local traffic between Lancaster and Philadelphia through Phoenixville, underwent reconstruction recently in the Lancaster area. Various phases of the two-lane, four-bridge project are shown in the accompanying pictures. Contractor: C. W. Good, Inc., Lancaster. Bridge reinforcing, bar mats and dowel units were supplied by Bethlehem.

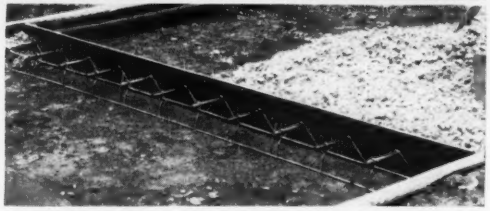
BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by
Bethlehem Pacific Coast Steel Corporation
Export Distributor: Bethlehem Steel Export Corporation

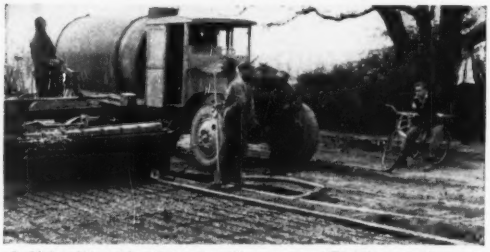
STEEL FOR HIGHWAYS

Dowel Units • Reinforcing Bars • Bar Mats • Guard Rail
Guard Rail Posts • Wire Rope and Strand
Pipe • Hollow Drill Steel • Spikes • Bolts and Nuts
Tie-Rods • Timber Bridge Hardware
Sheet- and H-Piling • Fabricated Structural Steel

BETHLEHEM STEEL



Bethlehem Dowel Unit, fitted with full-depth contraction plate, awaits batch.

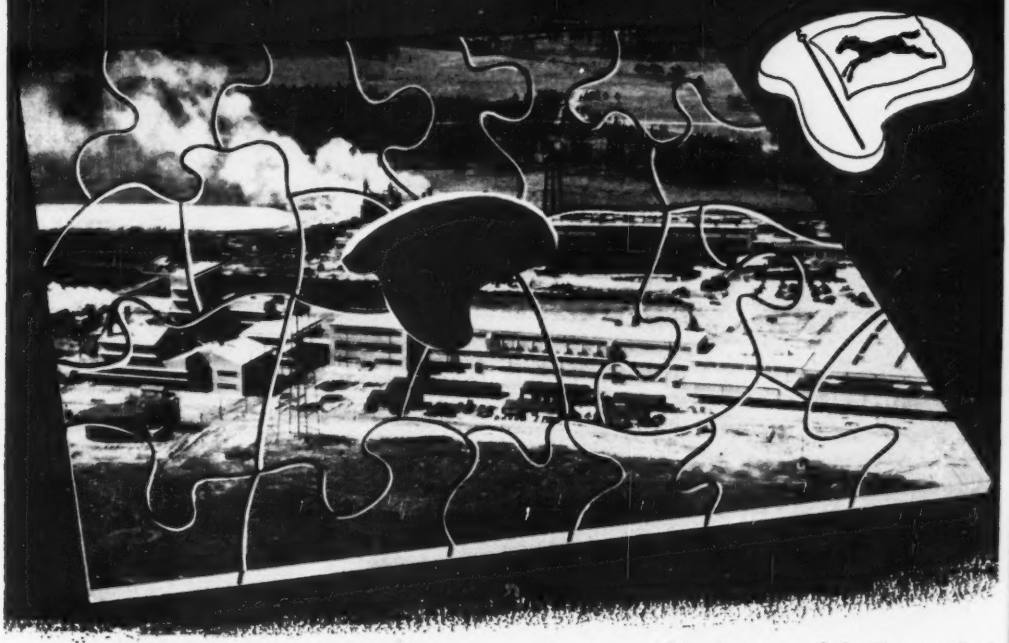


Bethlehem Hinged Bar Mat in place. The project used 75,000 sq yd of bar mats.

With the screed virtually on heels of skip, paving proceeds at lively pace.

Men in charge of the project take time out to pose for photographer. From left to right: Harry Henry, inspector, Pa. Dept. of Highways; Zeplan Lee, foreman, and John Long, superintendent for C. W. Good, Inc.; E. D. Colling, project engineer, and Thomas Jones and H. J. Koutris, inspectors, Pa. Dept. of Highways.

CONSTRUCTION



Since its adoption in 1860, the house flag of the Merritt-Chapman & Scott Corporation has flown over every conceivable type of construction project. Through the years the Corporation has earned a unique position in the construction field, by handling a variety of assignments throughout the world, with such speed and efficiency, that it has proven beyond any doubt; "Your confidence is justified where this flag flies."

Tunnels, piers, dams, housing projects, plants and mills, from foundation to roof, completely equipped and ready to operate; all these and many more come within the scope of the Corporation's seasoned forces.

Pictured above is the 200-ton Kraft mill and bag factory of the Alabama Pulp & Paper Co., at Cantonment, Fla. This is a typical Merritt-Chapman & Scott "turn-key" assignment. In addition to the construction work, the Corporation handled all of the wiring, piping, and the purchase and installation of all operating equipment.

If you are planning improvements to your present plant or mill, or the construction of a completely new installation, get in touch with your nearest Merritt-Chapman & Scott representative.

YOUR CONFIDENCE IS JUSTIFIED

LINK-BELT SPEEDER

LS-85 Helps Break Philadelphia Bottleneck

McNichol Paving & Construction Co., Completes 14 Month Job

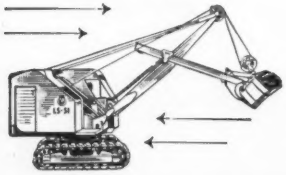
A Philadelphia traffic bottleneck was broken when the new Hunting Park Avenue-Ridge Avenue grade separation was completed.

McNichol Paving and Construction Company, contractors, found their LS-85 Link-Belt Speeder a valuable tool on this job, and it practically "broke a machine bottleneck" through its ability to perform a variety of operations. For over a year it worked at excavating, placing concrete, handling aggregate, forms, other materials, and cleaning up at the end. Operating 12 to 13 hours per day, the LS-85 was in perfect form every minute — a typical case of reliable high capacity performance and versatility you get in a precision-built, power-packed Link-Belt Speeder.

Be sure to see the

NEW LS-51

HALF-YARD LINK-BELT SPEEDER
with Speed-o-Matic Hydraulic Controls



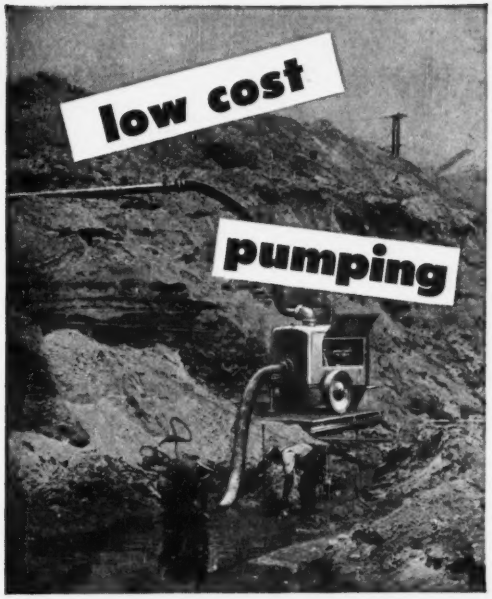
THE FINAL YARDSTICK FOR MEASURING HALF-YARD SHOVEL-CRANE PERFORMANCE

11,600

LINK-BELT SPEEDER

LINK-BELT SPEEDER CORPORATION, CEDAR RAPIDS, IOWA

Builders of the Most Complete Line of
SHOVELS-CRANES-DRAGLINES



JAEGER invites 5-way comparison with any other pumps

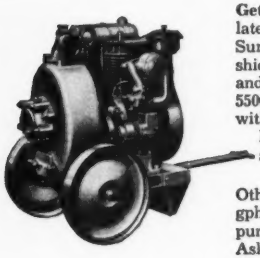
1 - Actual priming speed

2 - Vacuum, capacity and pressure

3 - Gallons of water moved per gallon of fuel

4 - Self-cleaning ability

5 - Hours of service per dollar invested



Get our Lower Price on latest heavy duty 2"-3" Sure-Primes with weather-shielded engines. Also 1½" and 2" aluminum pumps of 5500 and 9000 gph capacity with hardened replaceable liners and stainless steel shell fittings.

Other sizes 3000 to 240,000 gph. Drainage and pressure pumps. Gas, electric, diesel. Ask your Jaeger distributor or send for Catalog.

New standard Jaeger 125 ft. compressor instead of old standard 160 ft.

how a Jaeger user can cut costs:

3 men here instead of 6 (2 on the frame which holds 6 tampers, 1 man on the wall to handle hose).

Jack House watches costs go down.

When you free 3 men for other work and increase your production, that's cutting costs.

On the San Antonio Expressway, Killian House Company used these 6 backfill tampers in a frame to compact along the walls, reduced their tamping crew 50% and maintained continuous operation not possible where tampers are individually operated. The job, too big for any 105 ft. compressor, was successfully handled with a Jaeger "new standard" Model 125.

From the Model 75, that runs a heavy duty paving breaker, up to the Model 600 for 2 heavy wagon drills, every new standard "Air Plus" rating is designed to fit today's tools, gives you 30% to 40% more production at full pressure and efficiency, directly cuts your costs. Sizes are 75, 125, 185, 250, 365 and 600 cfm. See your Jaeger distributor.

Note:—Because of "Fuel Miser" speed control, Jaegers use no more fuel than smaller units when not delivering more air.

THE JAEGER MACHINE COMPANY

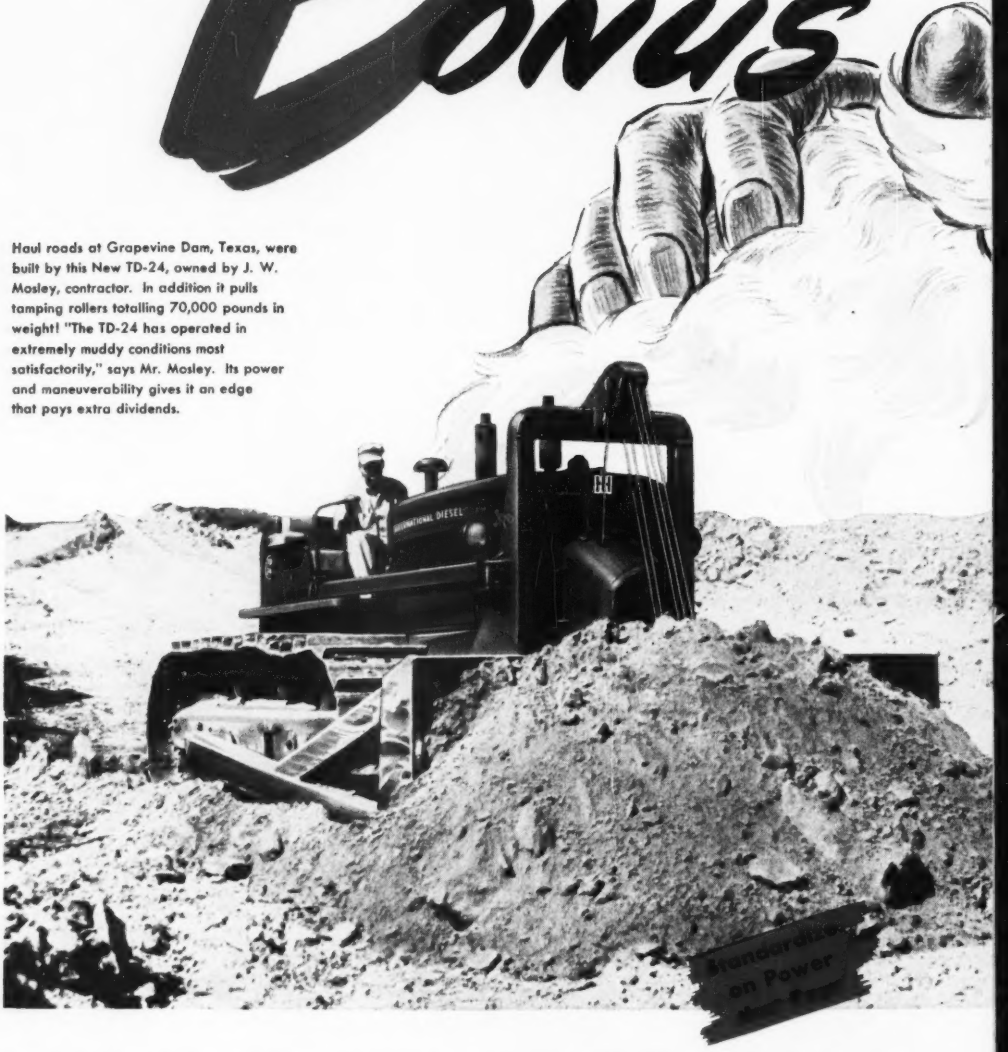
Columbus 16, Ohio — Cable Biganlitle

Leading distributors in 130 cities of the United States and Canada sell, rent and service Jaeger Engineered Equipment

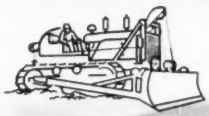
PUMPS • AIR COMPRESSORS • MIXERS • HOISTS • TOWERS
BITUMINOUS PAVERS • CONCRETE SPREADERS AND FINISHERS

BONUS

Haul roads at Grapevine Dam, Texas, were built by this New TD-24, owned by J. W. Mosley, contractor. In addition it pulls tamping rollers totalling 70,000 pounds in weight! "The TD-24 has operated in extremely muddy conditions most satisfactorily," says Mr. Mosley. Its power and maneuverability gives it an edge that pays extra dividends.



CRAWLER TRACTORS • WHEEL TRACTORS • DIESEL ENGINES • POWER UNITS



Extra profits are yours whenever the New International TD-24 diesel crawler takes on your heavy earthmoving jobs. By reducing your operating costs while increasing your payload production, the TD-24 actually hands you a bonus every working day!

No other crawler can match the TD-24 in work capacity.

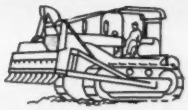
Quick starting, *on-the-go gear shifting*, instant high-low range speed changes, *eight speeds to 7.8 m.p.h. in each direction of travel*, and turns with power on both tracks are a few of the exclusive operating features which make the TD-24 your big bonus producer.

With its 140 drawbar horsepower, matchless maneuverability, and wide range of speeds at your finger tips, the New TD-24 is certainly the tractor you want. Thoroughly field-tested and job-proved, the New TD-24 is now available at your International Industrial Power Distributor's plant.

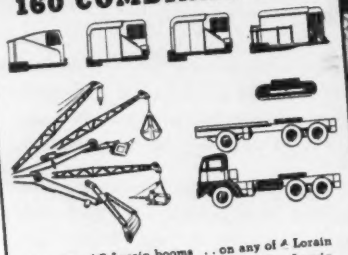
INTERNATIONAL HARVESTER COMPANY • CHICAGO

INTERNATIONAL HARVESTER

INTERNATIONAL INDUSTRIAL POWER



160 COMBINATIONS



Put any of 5 Lorain booms . . on any of 4 Lorain turntable capacities . . then select the Lorain mounting from crawler, Self-propelled rubber tire carrier (7 m.p.h.) or high speed Moto-Cranes (30 m.p.h.) . . then you're in business for top profits!

***STOP* At Your LORAIN Distributor**

• Your name on a Lorain puts you ahead of competition three ways. First, you have selected your Lorain from 160 combinations—the right *capacity*, the right *front end*, and the right *mounting* to exactly fit your immediate jobs. Second, you're set for many more jobs ahead—because you can interchange from crawler to rubber tires, or to any of 5 booms, to meet any travel condition or material handling problem. Finally, your Lorain is backed by the best equipped, best trained, best stocked Distributor organization in the shovel-crane business. And there's more still in the modern, long-lived design that has made Lorain the leader among builders of commercial size shovel-cranes.

It *will* be good business to *always* see your Lorain Distributor for every shovel-crane need. He will show you the way to bigger profits!

THE THEW SHOVEL CO., LORAIN, OHIO

THEW · Lorain®

SHOVELS · CRANES
DRAGLINES
CLAMSHELLS
HOES

★★★★ **Barber-Greene** ★★★★

PRTD. IN U. S. A. B-G COST-SAVING BULLETIN No. 4906 145M-AM-8-49

B-G PERFORMANCE PAYS DIVIDENDS TO USERS IN MATERIAL HANDLING, ASPHALT CONSTRUCTION AND DITCHING

B-G Conveyors operated by McGrath Sand and Gravel Co., to maintain a 15,000 ton surge stock pile at their Pekin, Ill., plant.

"B-G CONVEYORS ARE REALLY ENGINEERED"

Pekin, Ill.: Impressive evidence of the adaptability and flexibility of B-G Permanent Conveyors is presented in the local plant owned by the McGrath Sand and Gravel Co. Of their two standard "off the shelf" B-G Conveyors already operating—and a third, which is gradually replacing a twenty-year-old structure—R. H. Ashley, Superintendent, has this to say: "We like them; they are easy to erect, and fit into our operations nicely. They even *look* good—as if they have been engineered for the job."

At the Pekin plant, river sand is excavated by dredge and delivered to a crusher. Here a B-G Conveyor takes the material skyward in a spectacular rise to a discharge point in the center of an overhead bridge structure. (See photo at left.) This bridge permits the building of a 15,000 ton surge stock pile which makes dredging and plant operations independent of each other.

A tunnel conveyor underneath the pile carries material to a wood frame conveyor—being replaced a span at a time by B-G Conveyor sections—leading to the main plant.

Concrete Resurfacing "Big Business" for Owners of B-G Asphalt Equipment

Abilene, Kan.: Typical of the many contractors who have been keeping their B-G Asphalt Equipment profitably busy on resurfacing jobs, the Reno Construction Co. of Kansas has recently completed a project between Abilene and Chapman on U. S. Route 40.

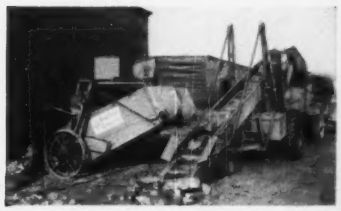
This important highway—18 feet wide and most of it around twenty-five years old—had disintegrated to the point where further maintenance was not justified. The contractor removed those areas which were beyond salvage, repaired or replaced the base material and relaid the concrete slab. A 24-inch bituminous concrete extension was laid on either side, and then the Barber-Greenes went to work.

Reno Construction Company's B-G 848 high-capacity Asphalt Plant—with Gradation Unit, Dryer and Dust Collector—produced 100 tons of asphalt cement mix, hour after hour.

B-G high capacity Bituminous Mixing Plants such as this are highly portable, easy to erect, accurate and simple in operation.

849289

B-G Tamping-leveling Finisher lays a smooth, level surface regardless of variations in the sub-grade.



847590

B-G 92 Car Unloader with 661 Gooseneck Conveyor.

"*A Pleasure to Recommend B-G Equipment*"

Asheville, N. C.: After Community Coal and Lumber Co. changed from hand unloading to mechanized B-G unloading of coal from railroad cars, their man-hour requirements were cut 66% while capacity of cars handled was doubled. With a B-G 92 Car Unloader and 661 Gooseneck Conveyor, one man now does the whole job. J. E. Divelbiss, Jr. of the Company further states, "We have been highly pleased with B-G Equipment—had very low maintenance. It is a pleasure to recommend Barber-Greene to anyone in this business."

Runabout Ditcher "Does Work of Three Crawler Machines"

849535

A large southern gas, light and water company reports that its B-G Runabout Ditcher has proved itself the "equal of three crawler-mounted machines in daily output." This pneumatic-tired ditcher is highly portable, travels under its own power. The company further reports, "the Runabout is ideal for laying small mains and services . . . in installing services across a black top street we allow traffic to cross the ditch without the aid of planks or bridges, since the ditch is only 6 inches wide.

B-G BUCKET LOADER PAYS FOR ITSELF SEVERAL TIMES OVER

B-G Model 522 Swivel Conveyor Bucket Loader operated by William Schwante & Sons, Chicago.

Cuts Man-Hours, Speeds Up Loading for this Material Yard

Chicago, Ill.: Since 1946, when purchased by William Schwante & Sons, a B-G 522 Swivel Conveyor Bucket Loader has paid for itself many times over by its savings in manpower alone. Further, in loading sand, gravel, stone and stoker coal at full capacity, the 522 has cut truck time to the bone—and its versatility, speed and portability have made it one of the most valuable machines in the yard. As Mr. Schwante puts it, "I can load a truck of stoker coal in practically nothing flat." He goes on to say that in the past three years repairs on his B-G 522 have been "next to nothing." Here again the widely useful pneumatic-tired 522 Loader proves that you can't beat B-G mechanized loading of free-flowing material.

Johnstown, N. Y.: By adapting their B-G 522 Bucket Loader to snow handling (with the B-G low cost snow flight line) the city of Johnstown, New York, has gained year-round use of their loader. In summer, sand and stone for paving operations are loaded. For winter service, the change is made and the loader clears windrowed snow from the city streets—loading a truck in a few minutes where before 4 to 6 men took half an hour for the same job.

"Big Brother" to the B-G 522 Loader, the 545A is a heavy-duty 3 cubic yard per minute, self-propelled machine.

At top capacity, stoker coal is reclaimed to truck with a B-G 672 Coal Loader at Fidelity Mines' radial layout.

B-G Radial Layout Speeds Truck Loading at Illinois Strip Mine

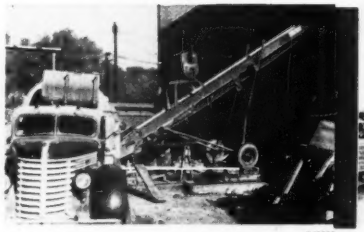
DuQuoin, Illinois: At the Fidelity Mine of the United Electric Coal Co., near DuQuoin, Ill., a completely equipped Barber-Greene radial coal handling layout with car unloader, stacker-conveyor and two self-propelled reclaiming coal loaders has considerably speeded up truck loading operations.

Once sized, cleaned and classified, the coal is delivered to the radial installation in hopper bottom cars. There it is unloaded with a B-G Model 93 pit car unloader and a radial-mounted, swivel wheel B-G flight type stacker conveyor.

Reclaiming into trucks of various sizes is done with either a Barber-Greene Model 672 cleated belt conveyor or a B-G power propelled Model 661 "Gooseneck" flight conveyor. Although nominally rated at 2 tons per minute, the 672, when loading stoker coal into large semi-trailer trucks, consistently handles up to 3 tons per minute. For larger sizes of lump coal, the "Gooseneck" 661 is employed, with its adjustable discharge permitting low drop into truck, preventing costly breakage.

The widely used, well-integrated B-G radial layout is proving itself an important time and labor saver when truck distribution of coal is desirable.

USERS FIND LOWEST COST WAY TO DO MANY JOBS IS WITH B-G PORTABLE CONVEYORS



B-G Portable conveyor delivering concrete to second floor from transit mixers.

A B-G Belt Car Unloader, Portable Conveyor and Bucket Loader team up on this job.

Speeds Concrete Placement

Alton, Ill.: Pouring concrete seats for a stadium, pouring walls and recently, pouring the second floor on a factory remodeling job—this is the class of work that has been turned over to a B-G Portable Conveyor by R&R Construction Company. On this latter job, the conveyor operated at a 30° incline, was started and stopped frequently with a full load on the belt without stalling. On job after job the versatile Barber-Greene has eliminated the need for a concrete elevator and has saved many dollars in time and labor in getting concrete into the forms.

Eliminate Truck Crane

Winnetka, Ill.: Unloading hopper-bottom cars of sand and gravel with a rented truck crane is an unsatisfactory operation—too costly, too slow—as discovered by Weissenberg Fuel Company of this town. With the purchase of a B-G 358 non-slip chain and belt car unloader and a B-G Portable Conveyor the company eliminated this expensive practice. This B-G team now unloads material in half the time and conveys it swiftly to the stock piles. It's a one-man operation—no high truck crane rental.

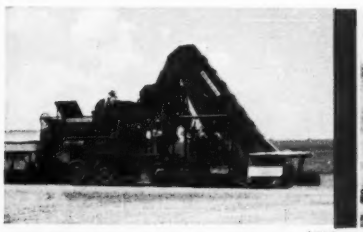
THREE B-G PLANTS MAKE POSSIBLE YEAR 'ROUND MAINTENANCE OF SOUTH DAKOTA ROADS

Operate Efficiently in Freezing Weather

Pierre, S. D.: Three B-G Maintenance Asphalt Plants are solving the problem of early spring road repair for the State Highway Department. Until now, early work has been seriously hampered by frequent freezing rains that made blade mixing impossible and delayed vital spring repairs.

Delivered in December, the plants were sent to Huron, Rapid City and Aberdeen. Each was set up in less than two days despite sub-zero temperatures. The Huron and Aberdeen plants went to work at once, producing a quality mix and providing maintenance crews with all the material required to maintain roads in good condition.

All plants are used to stockpile excess material close to the plant site during slack periods for future reclaiming as needed. The slow curing qualities of the bituminous mix produced for stockpiling make it possible to anticipate summer requirements—and to keep the plants usefully and economically at work practically the year 'round.

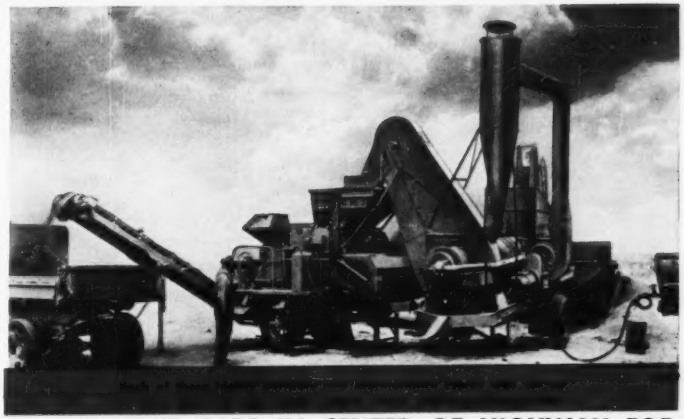


848548

The B-G Travel Plant offers lowest cost means of producing quality bituminous mixes.

Travel Plant Has Thousands of Miles Behind and Ahead of It

The B-G Travel Plant has for many years been identified with low cost, high quality bituminous roads. At minimum cost, it produces highest quality bituminous or stabilized "mixed in place" material. Consisting of two B-G units—the 848 Mixer which is towed and supplied by a B-G Paving Bucket Loader—the Travel Plant allows economical use of local materials. It does not obstruct traffic. Requires but two operators. Accurate proportioning saves asphalt and gives a uniformly finished job.



B-G DITCHER DIGS IN CENTER OF HIGHWAY FOR CONDUIT INSTALLATION

848274

B-G 44C Ditcher digging 24-inch by 4-foot conduit trench on busy concrete street.

Milwaukee, Wis.: Digging a 24-inch conduit trench down the center of a concrete highway and over numerous uncharted obstructions is the latest of many impressive performances of Stone Construction Company's B-G 44C Ditcher.

Here, concrete was broken up with jackhammers and removed for a path wide enough for the ditcher boom. The B-G automatic overload release prevented damage to both machine and pavement whenever, by chance, the bucket line came in contact with the concrete. Further, the ability of the B-G Vertical Boom to dig straight down, leaving no ramp, saved untold hours of hand digging: the 44C dug right up to underground obstructions.

Because the conduit was a foot or more thick, excessive backfill could have been a problem. The 44C loaded much of the material directly into trucks.

847488

The B-G 82A Crawler-mounted Loader is a heavy duty, 3 cubic yard per minute, sure-footed machine.

FAST LOADING, STRIPPING AND PICKUP WITH THIS B-G CRAWLER-MOUNTED LOADER

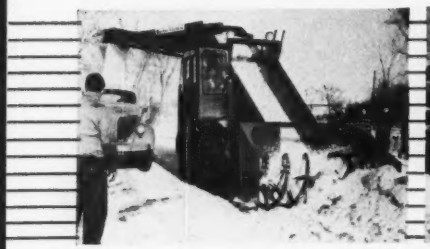
The husky, high capacity B-G 82A Loader has been setting records for output and versatility for years. On one job, two of these loaders excavated, screened and loaded 93,000 tons of bank-run gravel at a 1,000 tons per day clip. Another user reports 125,000 tons of sand handled by his 82A in two years with practically no repair cost. The 82A is a big high-discharge loader with all the B-G advantages—automatic overload release, floating boom, spiral feed, etc., ideal for the most severe service.

Ditcher Solves Problem with a New Slant to It

847397

Castle Shannon, Pa.: **Alleyways too steep to be negotiated by automobiles—up to 15° slopes—were the site of a recent job done successfully by a B-G 720 Ditcher for Equitable Gas Company. Operating easily in the steep, narrow alleyways, the Barber-Greene often completed 4 or 5 blocks of such digging in half a working day—this despite numerous cross walks and extreme rocky conditions of the soil.**

SNOW OR CORAL ROCK "Barber-Greenes" CUT THE COST AND TIME REQUIRED TO MOVE IT



B-G 548A Pneumatic-tired Snow Loader. Up to 20 cu. yds. per min. 7 m.p.h. road speed.

B-G 522 Pneumatic-tired Snow Loader 5 cu. yds. per min. Convertible to bucket loader.

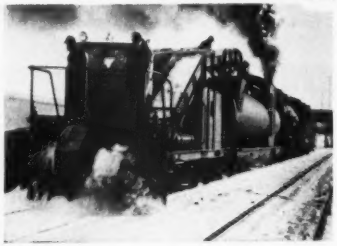
B-G 710 Ditcher sets outstanding performance record on 100 mile coaxial cable job.

FAST CLEANUP OF CITY STREETS

B-G Snow Loaders have proved themselves throughout the "snow belt" as efficient, effective means of keeping city traffic moving, saving parking meter revenues and radically cutting the costs of snow removal. They offer benefits that can mean real savings to small towns as well as the largest cities.

B-G Snow Loaders provide fast, efficient snow removal service under the most severe conditions.

B-G Railroad Snow Loader-Melter. Clears yards, terminals, loading areas. Capacity, 30 cu. yds. per min.



ROCK AND TREE STUMPS GIVE WAY TO B-G DITCHERS

Orlando, Fla.: Digging up to 1½ miles in a 4½ hr. working day—through stump-strewn coral rock—is the regular performance of two B-G 710 cable laying ditchers on this 100-mile coaxial cable job. The rapid saw-like action of the B-G Bucket line overcame the stump and rock problems. The cable is fed from a large reel and the ditchers tow backfilling plows which close the trench behind the cable.

FOR THE LATEST IN MATERIAL HANDLING, ASPHALT CONSTRUCTION OR DITCHING . . . USE THE COUPON

Complete specifications and literature are available on all the B-G equipment described in this bulletin. The coupon below makes it handy for you to quickly receive information which may lead to many cost-reducing improvements in your business operations. Look this bulletin over carefully and send in the coupon today.

Barber-Greene Company
Aurora, Illinois, U.S.A.
Cable address "Bargreene"

- ☐ Send information on B-G equipment as indicated
- ☐ Have Barber-Greene representative call
- ☐ B-G Bituminous Mixing Plants of ——— capacity
- ☐ B-G Travel Plants
- ☐ B-G Bucket Loaders of ——— capacity
- ☐ B-G Permanent Conveyors
- ☐ B-G Portable Conveyors
- ☐ B-G Coal Yard Equipment
- ☐ B-G Ditchers
- ☐ B-G Snow Loaders
- ☐ B-G Belt Car Unloaders

Name .....

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Position .....

Address ..... City ..... State .....

CM—29,600

YOUR B-G DISTRIBUTOR IS THE BEST SOURCE OF RELIABLE ADVICE AND SERVICE

There is a Barber-Greene Distributor near you, ready to give you personalized information regarding your specific requirements and where B-G equipment fits into your picture. At your service is his staff of trained service and sales experts. When you talk with your Barber-Greene distributor, you can have the fullest confidence in his ability to specify for your needs.

Your B-G Distributor can give you other cost-saving bulletins listed below:

Bulletin 4901 Portable Conveyors
Bulletin 4902 Bucket Loaders
Bulletin 4903 Bituminous No. 1
Bulletin 4904 Ditchers
Bulletin 4905 Permanent Conveyors
Bulletin 4907 Bituminous No. 2

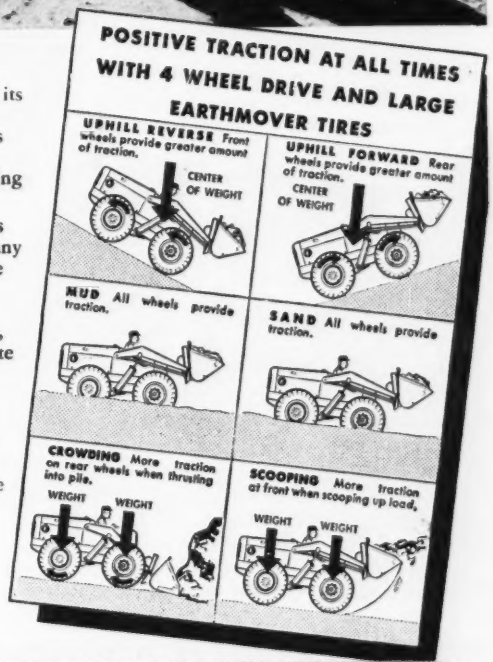
BARBER-GREENE COMPANY
Aurora, Illinois, U.S.A.

4 Wheel Drive PAYLOADER

The new Model HM Payloader has already proved its power, speed, traction and flotation on hundreds of projects for scores of owners . . . its ability to do jobs never before practical for wheeled tractor shovels . . . its digging power and loading, grading and stripping speed under poor ground conditions.

Four-wheel drive on large earthmover tires accounts for the HM's tremendous traction and flotation, but many other features contribute to its outstanding performance . . . power-boosted rear wheel steering, four speeds in each direction up to 24 mph, quick-acting, forward-reverse control, operator-controlled hydraulic dumping, powerful hydraulic brakes, easy operation and complete operator visibility.

The Model HM travels to the job fast on its own power over pavement or ground. It has 1½ cu. yd. bucket and 76 hp gasoline or diesel engine. "V" and Reversible Blade snow plows are available to make it a powerful snow fighter. Bulldozer Blade and Crane Hook attachments, also available, further increase its usefulness. Get full facts on this big, unique, multipurpose Tractor Shovel from your Hough Distributor or write The Frank G. Hough Co., 706 Sunnyside Avenue, Libertyville, Illinois.


POSITIVE TRACTION AT ALL TIMES
WITH 4 WHEEL DRIVE AND LARGE
EARTHMOVER TIRES
UPHILL REVERSE Front wheels provide greater amount of traction.
CENTER OF WEIGHT
UPHILL FORWARD Rear wheels provide greater amount of traction.
CENTER OF WEIGHT
MUD All wheels provide traction.
SAND All wheels provide traction.
CROWDING More traction on rear wheels when thrusting into pile.
WEIGHT
WEIGHT
SCOOPING More traction at front when scooping up load.
WEIGHT
WEIGHT

WRITE for full information on any size of PAYLOADER, the 1½ yd. Model HM; the 1¼ yd. Model HL; the 3/4 yd. Model HF; the 12 cu. ft. Model HA.

HOUGH
SAY HUFF
PAYLOADER
Manufactured by THE FRANK G. HOUGH CO.

If you want peak production from your equipment

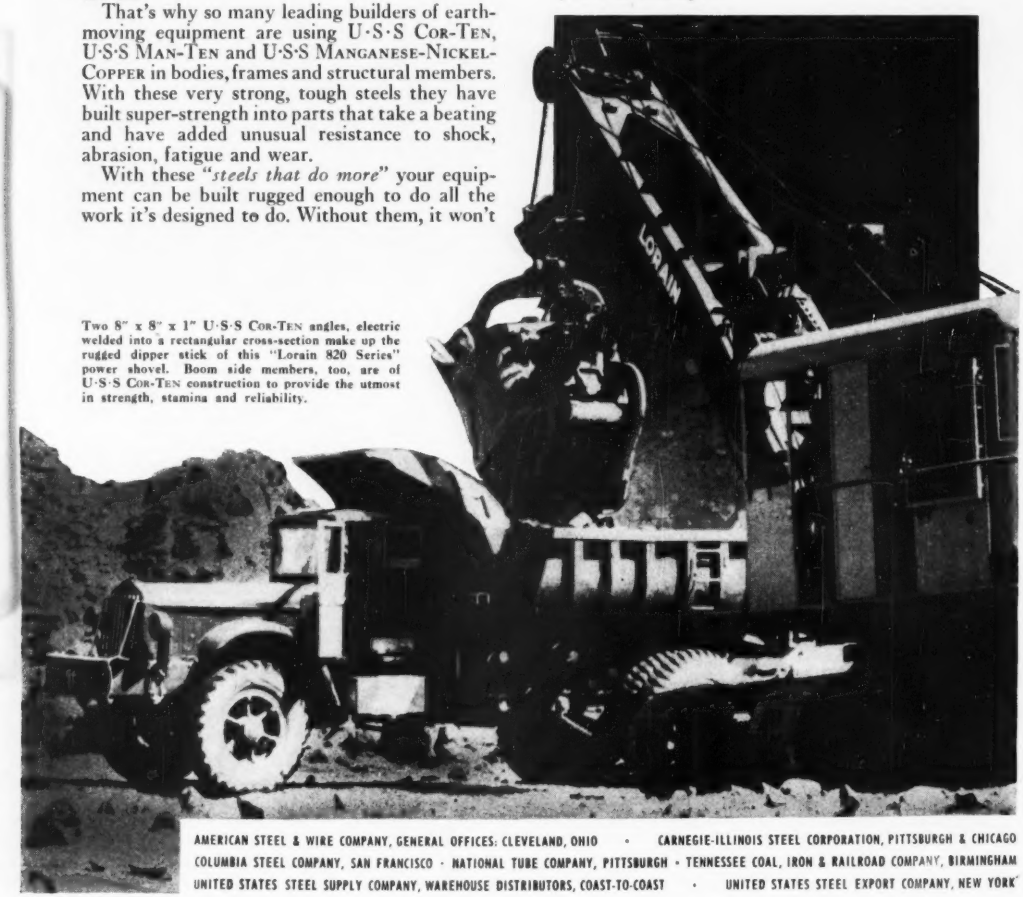
—you've got to build it *rugged!*

POWER, speed, capacity and maneuverability—the more you increase them the more yardage your equipment will move, the faster it will operate and the lower the cost of operation. But *only* if it has the stamina to stand up under slam-bang operation day after day. Rugged strength and plenty of it—is a basic requirement of heavy-duty shovels, scrapers, ditchers, 'dozers and trucks.

That's why so many leading builders of earth-moving equipment are using U·S·S COR-TEN, U·S·S MAN-TEN and U·S·S MANGANESE-NICKEL-COPPER in bodies, frames and structural members. With these very strong, tough steels they have built super-strength into parts that take a beating and have added unusual resistance to shock, abrasion, fatigue and wear.

With these "*steels that do more*" your equipment can be built rugged enough to do all the work it's designed to do. Without them, it won't stay on the job as it should—without them, maintenance costs and break-downs will cut deep into your profits.

For more than 14 years we have been supplying U·S·S High Strength Steels for equipment that is famous for stamina and performance. The wealth of practical engineering and fabricating data we have accumulated by this experience is freely yours to call upon.



Two 8" x 8" x 1" U·S·S COR-TEN angles, electric welded into a rectangular cross-section make up the rugged dipper stick of this "Lorain 820 Series" power shovel. Boom side members, too, are of U·S·S COR-TEN construction to provide the utmost in strength, stamina and reliability.

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COLUMBIA STEEL COMPANY, SAN FRANCISCO · NATIONAL TUBE COMPANY, PITTSBURGH · TENNESSEE COAL, IRON & RAILROAD COMPANY, BIRMINGHAM
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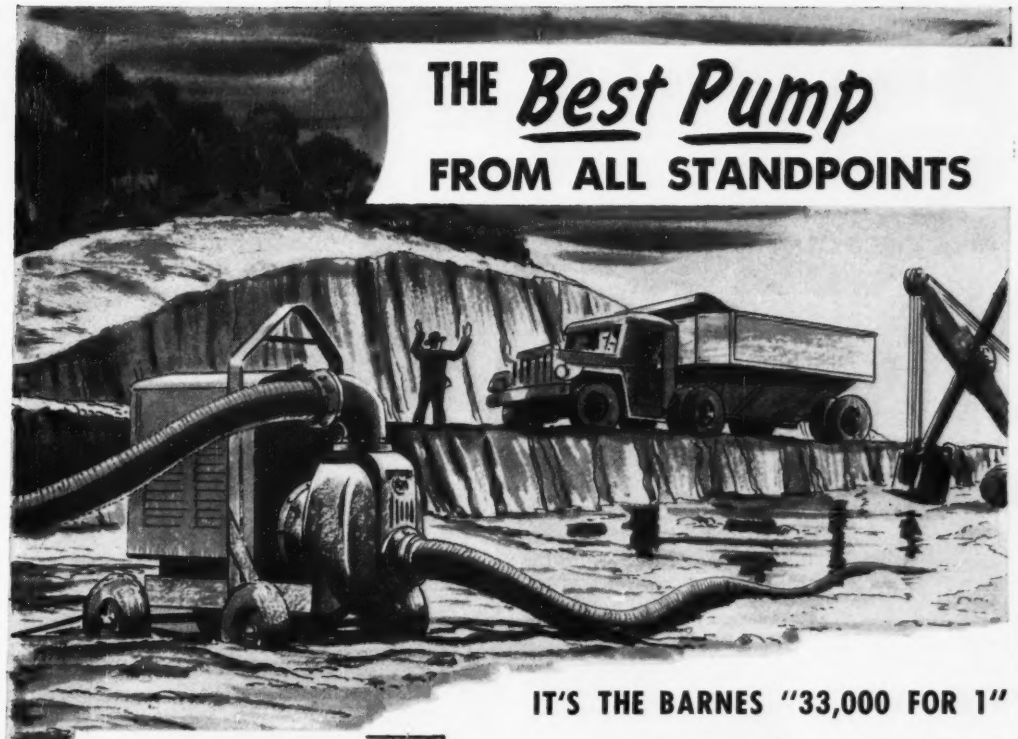
U·S·S HIGH STRENGTH STEELS

U·S·S COR-TEN · U·S·S MAN-TEN · U·S·S MANGANESE-NICKEL-COPPER

9-2036

UNITED STATES STEEL

THE *Best Pump* FROM ALL STANDPOINTS

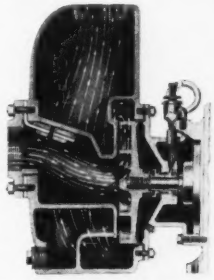


IT'S THE BARNES "33,000 FOR 1"

Any way you want to look at it, Barnes "33,000 for 1" Automatic Centrifugals will deliver more gallons of water for your pumping dollars.

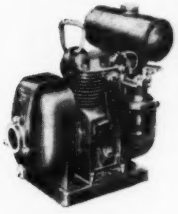
Think of getting not 1,000 — not 10,000 — but 33,000 gallons of pumped water on only 1 gallon of gas! Look at the construction of the Barnes Pump itself. It's massive where mass counts in heavy-duty work — yet it's not loaded with excess weight — it handles easily!

Good looking on the outside, they look even better on the inside — inwardly streamlined for lowest friction loss — Peri-Prime feature for lightning-fast, sure priming—Barnes Life-Time Super Seal for long service — Special Non-clogging Impeller for constant operation. Whether it's performance, appearance, or economy of operation, your best buy is Barnes.



NOTHING BEATS A STRAIGHT LINE FOR GETTING THERE

See how the suction of Barnes Pumps is direct-in-line with the impeller? This means less friction loss—more water for your pumping dollar every time with Barnes "33,000 for 1" Pumps.



FROM 3,000 TO 90,000 G.P.H.

A choice for every need! Barnes complete line ranges from 3,000 to 90,000 G.P.H. in capacities. Buy the Best—Buy Barnes.

BARNES MANUFACTURING CO.

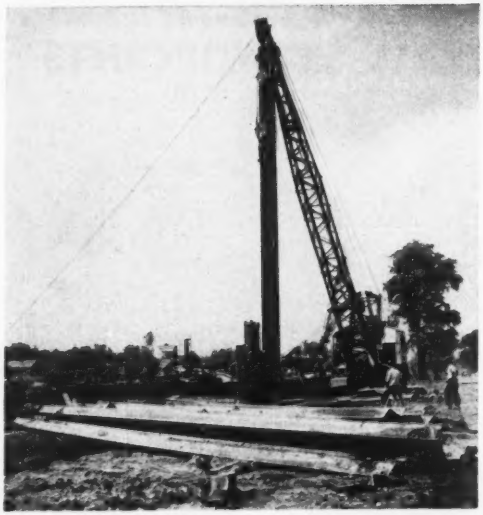
MANSFIELD, OHIO

Water Control Products for Over 50 Years

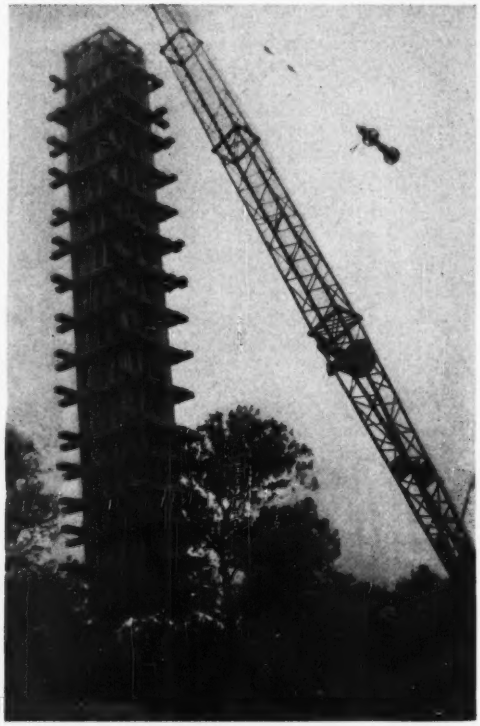
Readers' Picture Page

READERS ARE INVITED to send in photo contributions to this page each month. A minimum of $5 will be paid for each picture published. Extra bonuses for outstanding shots may bring you $10, $15, or $25.

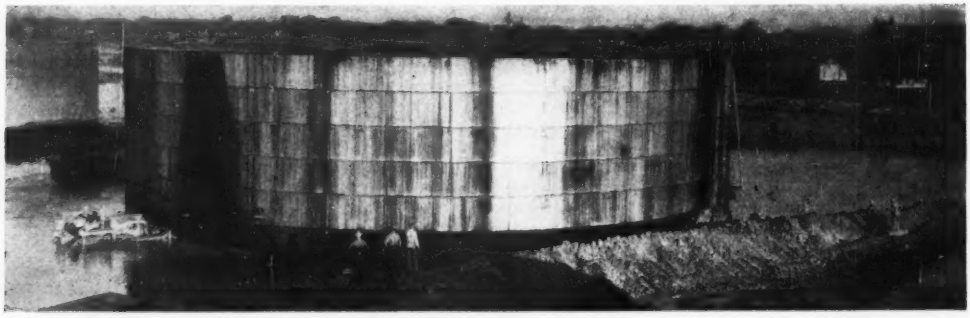
Send in your job photos to the Photo Editor, *Construction Methods and Equipment*, 330 W. 42nd St., New York 18, N.Y. Every effort will be made to return unacceptable prints, but their return cannot be guaranteed.



OFTEN A SHEETPILING JOB presents problems of removal but Allied Contractors of Detroit rigged up this method on Candler and Bass section of that city's Hubbel-Southfield storm sewer. They fastened a 40-ft. 18x18-in. timber to the boom of their No. 6 Northwest crane and reeved rope through two five-gang blocks to exert tremendous pull and support boom simultaneously. Pole moves freely or may be lashed to boom to facilitate crane travel. Bonus of $25 for these pictures goes to Howard Elliott of 17601 Michigan Avenue, Detroit.



WHILE PLACING HUGE FORM, crane operator John E. Marsh of 525 Walnut St., Denver, Pa., earned himself our $10 bonus. Photo shows 4x4-ft. bridge column form, 40 ft. long, with waiers attached and reinforcing inside, being placed as a unit over dowels in foundation wall. Job, handled by Brayman Construction Co., is part of Pennsylvania Turnpike. Total weight for each form is 7 tons.

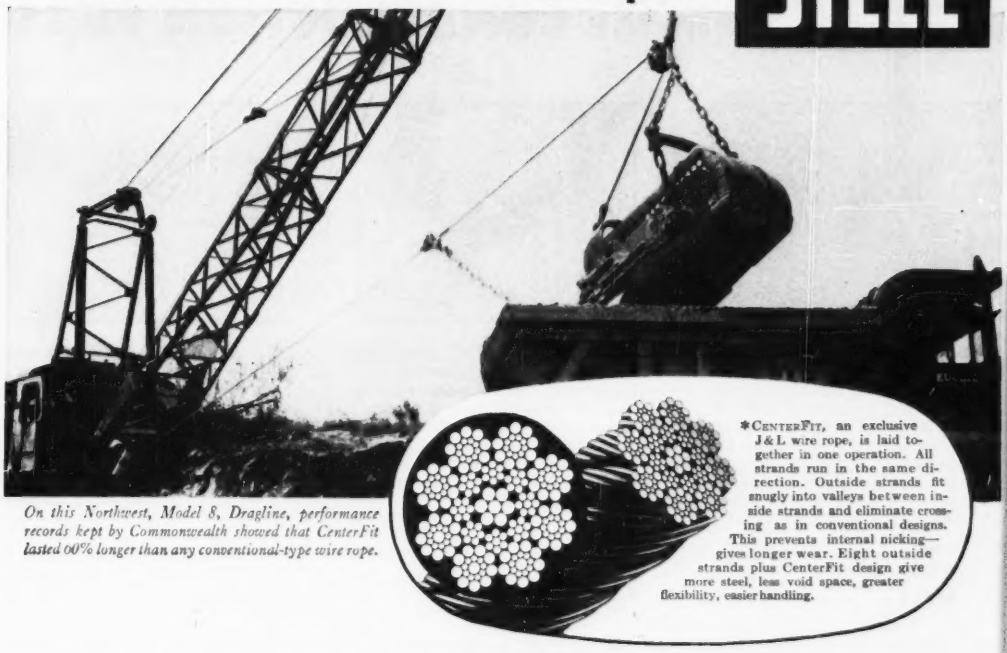


TANK MOVING MADE EASY. A 200-ton tank with 55,000-bbl. capacity was pushed 1,000 ft. through a specially built canal in Toledo, Ohio, for the Sun Oil Co., and as a result, Catalytic Construction Co.'s industrial relations manager Alan McCone earns bonus of $15 for his unique photo. Philadelphia contracting firm used 4¼ million gal. of water in ditch to reach 2-ft. depth for big push by bulldozer. Earth fill from canal bed was used to form retaining banks and bulldozed back after job.

COMMONWEALTH SAND & GRAVEL CORP.

gets 30% to 60% longer service with J&L CenterFit* Wire Ropes

J&L STEEL



On this Northwest, Model 8, Dragline, performance records kept by Commonwealth showed that CenterFit lasted 60% longer than any conventional-type wire rope.

*CenterFit, an exclusive J&L wire rope, is laid together in one operation. All strands run in the same direction. Outside strands fit snugly into valleys between inside strands and eliminate crossing as in conventional designs. This prevents internal nicking—gives longer wear. Eight outside strands plus CenterFit design give more steel, less void space, greater flexibility, easier handling.

. . . *in addition,* CenterFit* Wire Ropes *cost less than ropes replaced*

Commonwealth Sand and Gravel Corporation, of Richmond, Va., produces 75,000 to 80,000 tons of sand and gravel a month. In such an operation wire rope draglines are of vital importance—important enough to maintain detailed service records that show the life obtained from each wire rope.

Let's look at Commonwealth's records with J&L CenterFit:

On a Northwest, Model 8, dragline with a 2 cu. yd. bucket, conventional wire rope draglines had an average life of from 90 hours to 100 hours. The first J&L CenterFit preformed Permaset wire rope dragline used on this machine lasted 160 hours. The second, still in service, has equalled this record.

On a Marion 362 dragline with a 1½ cu. yd. bucket, J&L CenterFit wire rope draglines lasted, on the average, more than 30% longer than higher priced conventional wire rope.

It's records like these that prove again and again the extra value and savings operators get from CenterFit preformed Permaset—an exclusive J&L wire rope construction. J&L CenterFit has greater strength and flexibility than most wire ropes. Under constant usage J&L CenterFit usually outlasts other types of wire rope and is, therefore, more economical to operate.

The new J&L booklet "CenterFit" tells you where to use this exclusive wire rope. It is written for the man on the job. Let us send you a copy.

Jones & Laughlin Steel Corporation
436 Jones & Laughlin Building
Pittsburgh 19, Pa.

Please send me a copy of your new wire rope booklet describing "CenterFit" wire rope.

NAME_____

COMPANY_____

ADDRESS_____

JONES & LAUGHLIN STEEL CORPORATION

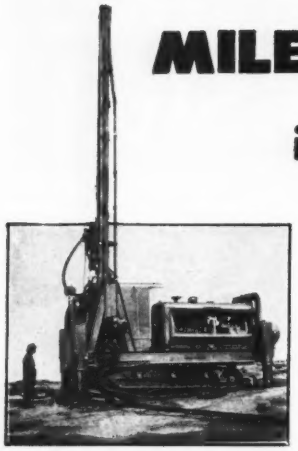
From its own raw materials, J&L *manufactures a full line of carbon steel products, as well as certain products in* OTISCOLOY *and* JALLOY *(hi-tensile steels).*

PRINCIPAL PRODUCTS: HOT ROLLED AND COLD FINISHED BARS AND SHAPES • STRUCTURAL SHAPES • HOT AND COLD ROLLED STRIP AND SHEETS • TUBULAR, WIRE AND TIN MILL PRODUCTS • "PRECISIONBILT" WIRE ROPE • COAL CHEMICALS

Test your I-R. Q. on these

MILESTONES OF PROGRESS

in the CONSTRUCTION FIELD

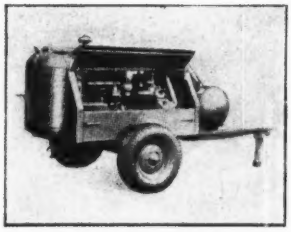


1 The revolutionary ***Quarrymaster Drill,*** introduced by Ingersoll-Rand in 1947, has opened new opportunities for speed and economy in open pit mining, quarrying and road building. This self-contained unit includes the drill, compressor, power unit and accessories. With Carset Bits, the Quarrymaster out-drills conventional equipment by as much as . . .

- ☐ **2 to 1**
- ☐ **4 to 1**
- ☐ **10 to 1**

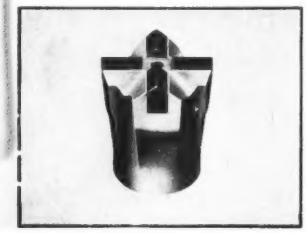
2 The ***paving breaker*** is probably the most universally used of all air power tools. You'll find it doing yeoman service on all kinds of construction, demolition and maintenance work. Ingersoll-Rand has been building these light-weight, high-powered tools since 1911. As compared to hand methods, one paving breaker can do the work of . . .

- ☐ **2 men**
- ☐ **15 men**
- ☐ **5 men**



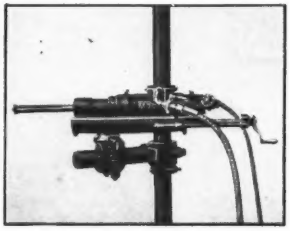
3 This modern I-R ***portable compressor***—known the world over as the Mobil-Air—is the descendant of a long line of portables, which first appeared in our catalog in 1902. Ingersoll-Rand has pioneered every major advance in portable compressors in the last 47 years — including the I-R Drill-More regulator which was introduced in . . .

- ☐ **1939**
- ☐ **1948**
- ☐ **1932**



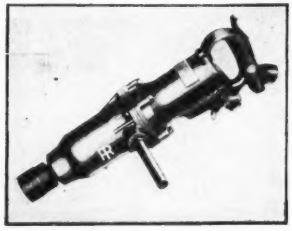
7 The ***Carset Jackbit,*** with inserts of tungsten carbide, was introduced by Ingersoll-Rand in 1946 and is acclaimed by many operators as the greatest single advance in modern rock drilling history. Its performance and cost saving features are truly spectacular. Under average conditions, it will outlast a steel bit usage by . . .

- ☐ **25 to 1**
- ☐ **50 to 1**
- ☐ **100 to 1**



8 Many old timers will recognize this as J. George Leyner's ***hammer drill*** — it was the first successful application of the hammer principle, using hollow drill steel through which air and water were directed to remove cuttings. The Leyner Company was consolidated with Ingersoll-Rand in the early development stage of this drill, which was introduced in . . .

- ☐ **1897**
- ☐ **1887**
- ☐ **1907**



9 Ingersoll-Rand's labor-aiding rotary ***Impactool*** reduces nut running time as much as 90 per cent, without any kick or twist to the operator — speeds up drilling, reaming and tapping jobs, too. Models are available for operation by either air power, high-cycle electric or universal electric power. Under ordinary conditions, an Impactool can pay for itself in . . .

- ☐ **20 days**
- ☐ **30 days**
- ☐ **90 days**

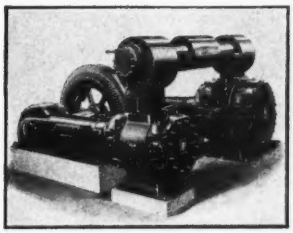
OVER 75 YEARS OF SPECIALIZED EFFORT

Pictured on these pages are ten typical Ingersoll-Rand products commonly used by contractors. Some are new—some are old. But each one represents an important milestone of progress in the construction field.

Many of you will remember from your own experience the approximate date on which these products were introduced, also other interesting facts about them.

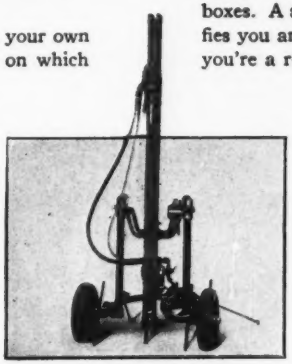
Now, just for the fun of it, see how many of the questions below you can answer correctly . . .. place a check mark in the proper boxes. A score of five is good. Seven qualifies you an expert. If you get all ten right, you're a real "Hard Rock Man!"

See answers below



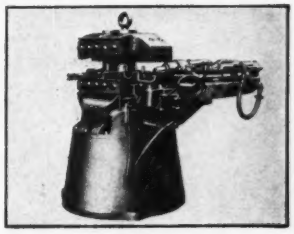
4 The ***channel valve***, which raised compressor efficiency to new heights, and the first direct-connected, synchronous-motor-driven compressors are but a few of many improvements pioneered by Ingersoll-Rand during the past 70 years. The famous channel valve was introduced on one of the following dates:

- ☐ **1935**
- ☐ **1920**
- ☐ **1915**



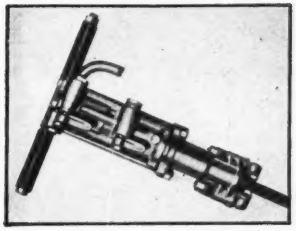
5 In 1920 the first Ingersoll-Rand ***wagon-mounted drill*** was placed on the market. Today, I-R Wagon Drills are making lighter work of construction jobs all over the world — saving time and effort and increasing the footage drilled per shift. On the average, they will out-drill hand-held drills by . . .

- ☐ **2 to 1**
- ☐ **5 to 1**
- ☐ **1½ to 1**



6 Forging of bits and shanks by hand was an art mastered by few. It was hard work and the results were far from accurate. But hand forging was eliminated when Ingersoll-Rand developed the ***drill steel sharpener.*** A good sharpener operator working on collared shanks can usually beat hand methods by . . .

- ☐ **10 to 1**
- ☐ **16 to 1**
- ☐ **20 to 1**



10 Every rock drill man is familiar with the ***Jackhamer.*** But perhaps few stop to realize that its development was one of the most important steps in rock drilling. For this hand-held drill replaced slow and expensive piston drills and made all hand drilling obsolete. The first automatically rotated, hand-held Jackhamer was introduced by Ingersoll-Rand in . . .

- ☐ **1912**
- ☐ **1900**
- ☐ **1920**

ANSWERS:
(1) 10 to 1, (2) 15 men, (3) 1939, (4) 1935, (5) 5 to 1, (6) 16 to 1, (7) 100 to 1, (8) 1897, (9) 30 days, (10) 1912.

DONT STOP WITH ONE I-R PRODUCT

Use the IR CONTRACTORS' COMBINATION

- *Everything you need for rock drilling.*
- *Top quality machines that work as a team.*
- *Machines designed, built, sold and serviced by men who know rock excavation . . . application "know how."*

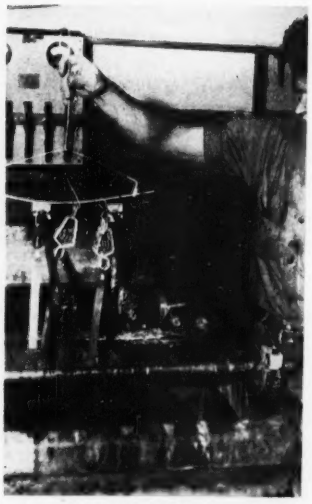
Ingersoll-Rand

11 BROADWAY, NEW YORK 4, N. Y. 447-S

IN THE FIELD OF CONSTRUCTION

HOW THEY DID IT

A WAREHOUSE IN Kearny, New Jersey, was sinking. Underpinning and Foundation Co., New York, had to remove 16,000 cu.yd. from under building. No headroom for digging machinery so they brought in one of Hewitt-Robins Inc. conveyor units with a 239-ft. belt. As belt was increased to 440 ft., spoil increased from 60 to 250 cu.yd. per day.



WORN FILES AND RASPS are restored in 5 min. by electro-cleaning process using chromic and nitric acid. Method was devised by Robert Rohweller, Air Force employee.

NO OVERLOADS on Solar Aircraft's lifters at San Diego plant. Tool superintendent Wally Marrow's device, heavy-duty die spring in steel housing, is calibrated for maximum safe load. Full spring compression activates solenoid which stops up travel, applies brake, allows only down travel until released.

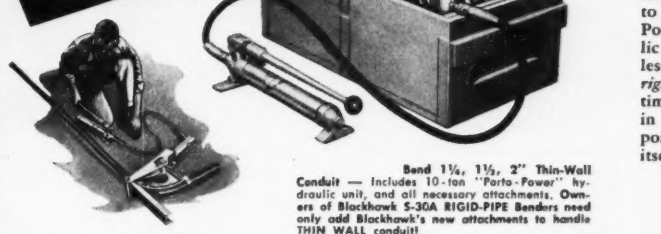
THIS HYDRAULIC CLAMP, capable of exerting a force of 250,000 lb. per sq. in., is holding flanges for welding to 17-ton section of 12-ft.-dia. discharge pipe for Grand Coulee Dam pumping plant. Consolidated Western Steel Corp. is subcontractor on job for Morrison-Knudsen-Peter Kiewit Sons Co. combine.

TO FORM SEA WALL on Cuttyhunk Island, off coast of New Bedford, Mass., Savin Construction Corp. shipped three Heiliner diesel power units and bottom-dumps to island. Ten old 250-ft. barges were loaded with 150,000 yd. of gravel from island pits, towed to place and strung out to form 2,500-ft. wall. Bottoms were dynamited and they settled to form seawall foundation.

Announcing...

THREE GREAT TIME SAVERS!

NEW! S-34 KIT



A "REMOTE-CONTROL" THIN-WALL CONDUIT BENDER

Now—bend thin-wall conduit efficiently, profitably — thanks to Blackhawk's famous "Porto-Power" all-directional hydraulic unit. Make beautiful, kinkless bends, matched offsets and *rigid* installations in new record time. Create dramatic savings in materials. This low-cost, portable equipment pays for itself on your first good job!

Sight progress of bending from the most convenient spot **because the hydraulic ram is remotely-controlled!**

Bend 1¼, 1½, 2" Thin-Wall Conduit — Includes 10-ton "Porto-Power" hydraulic unit, and all necessary attachments. **Owners of Blackhawk S-30A RIGID-PIPE Benders need only add Blackhawk's new attachments to handle THIN WALL conduit!**

NEW! SB-40 KIT

Punches 6 Conduit Opening-Sizes — ½, ¾, 1, 1¼, 1½, 2". Includes punches and new-type "Porto-Power" pull-ram.

HYDRAULIC KNOCK-OUT PUNCHES

NEW! SB-41 KIT

Punches 10 Conduit Opening-Sizes — ½, ¾, 1, 1¼, 1½, 2, 2½, 3, 3½, 4".

No wrench to swing — a few easy strokes on the hydraulic pump and the hole is punched!

At last you can punch conduit openings in electrical distribution boxes, pull boxes, etc., with smooth *hydraulic* power! Eliminate wrench operation and distortion or loosening of boxes. Work in tightest spots. Safer. 3 to 5 times faster. Use same "Porto-Power" pump and fittings which serve Blackhawk Benders.

Send Coupon today or write for new literature covering all Blackhawk Electrician's Equipment

BLACKHAWK

HYDRAULIC *Porto-Power* EQUIPMENT

Blackhawk is the *world's largest maker of high-pressure hydraulic equipment* and specializes in producing time-saving hydraulic tools for electricians, construction and industry. Buy from leading supply houses.

BLACKHAWK MFG. CO.
Dept. P23129, Milwaukee 1, Wis.

Without obligation, rush new Bulletin B-50 giving full facts on Blackhawk's entire line of Electrician's Equipment.

Name.....

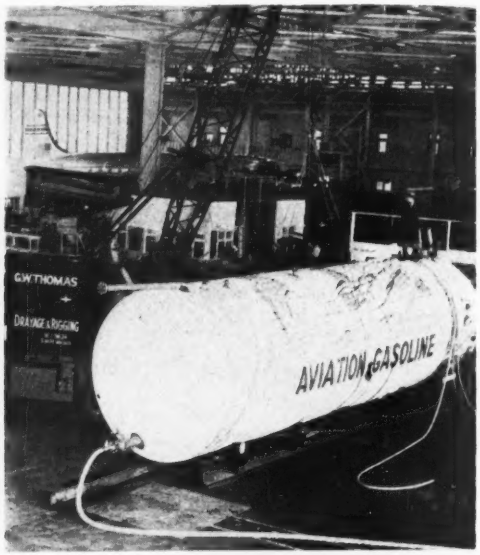
Address.....

City.....Zone...State.....

JOB ODDITIES

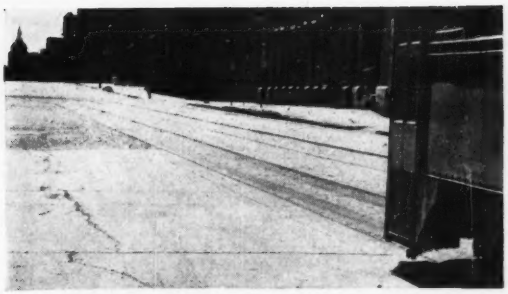
TWO NEAT MODELS—large and small. One is a Prepakt concrete bridge pier built for testing at concrete research laboratory of U. S. Corps of Engineers Waterways Experiment Station, Clinton, Miss. The other is Mildred Miller, petite photographer and staff member for Clinton station.

BEFORE AND AFTER. P. J. Walker Co., Los Angeles contractor, apologized as riveting began and announced completion by hanging signs for benefit of workers near new General Petroleum Corp. building in Los Angeles.



FACED WITH DELIVERY of Boeing Stratocruisers, Pan American Airline officials wondered if hanger floor would support 50-ton weight of plane and gasoline load. Borrowing a 13,000-gal. tank, they set it on bearing surfaces similar to those of landing gear, and filled it with 73 tons of water. Floor held up with adequate safety factor, assuring safe future plane moving and storage.

RAISE THE ROOF! That's what one veteran did about housing shortage. In Fort Worth, Tex., ex-Lieutenant John V. Watson unfastened his father's garage roof, inserted two supporting timbers, had a local contractor pick it up with his Lorain Moto-crane and hold it for 4 hr. while carpenters put studs and bracing in place for future second-floor home.



Ten Years Ago...

A Decade of ATLAS DURAPLASTIC AIR-ENTRAINING PORTLAND CEMENT

in August, 1939, this concrete test paving was laid in Second Avenue North, Minneapolis. The badly scaled section of roadway in the background was made with regular portland cement. The foreground section, *laid at the same time*, was made with Atlas Duraplastic—the first commercial use of the air-entraining portland cement originated and developed by Universal Atlas.

Both sections, subjected to the severity of ten Minneapolis winters and to heavy applications of de-icing salts, are shown just as they appeared in July, 1949—convincing proof of the characteristic durability of Duraplastic concrete, of its high resistance to freezing-thawing weather and the scaling action of de-icing salts. Longitudinal structural crack shows some ravelling. Note perfect transverse joint.

Today.... Added Durability and Improved Appearance in structural concrete made with DURAPLASTIC*

Promontory Apartments, Chicago, Ill., nearing completion. Duraplastic used throughout in concrete columns 12 feet deep with network of steel bars and beams. No sign of bleeding or segregation. Contractors report a smooth surface free of blemishes or air-bubbles. Architect: Pace Associates; Structural Engineer: Frank J. Kornacker; Contractor: Peter Hamlin Construction Company—all of Chicago.

From initial paving installations . . . to the first structural job . . . to beautiful, modern structural achievements like the one shown here, architects, engineers and contractors have come to rely more and more on the extra durability and improved appearance of concrete made with Atlas Duraplastic air-entraining portland cement.

In Duraplastic's rapid ten-year growth, its advantages have been applied to all types of mass and structural concrete—for foundations, walls, columns, and floors. It's ideal for slip-form, gunite, stucco and similar uses.

With Duraplastic, less mixing water is needed for a given slump. The resulting mix is more plastic, more workable, more uniform and cohesive. It's easy to place and finish. Water-gain and segregation are reduced. Surface appearance is improved and has higher resistance to the effects of weather-exposure.

For structural concrete needs of today and tomorrow, Duraplastic offers *better concrete at no extra cost*. It provides the precise amount of air-entraining agent interground with the cement for satisfactory field performance. It complies with ASTM and Federal Specifications, sells at the same price as regular cement and calls for no unusual changes in procedure.

Send for new free booklet, *"A Decade of Duraplastic Air-Entraining Cement." Write to Universal Atlas Cement Company, (United States Steel Corporation Subsidiary), Chrysler Bldg., New York 17, New York.*

OFFICES: Albany, Birmingham, Boston, Chicago, Dayton, Kansas City, Minneapolis, New York, Philadelphia, Pittsburgh, St. Louis, Waco.

*"Duraplastic" is the registered trade mark of the air-entraining portland cement manufactured by Universal Atlas Cement Company.

CM-D-91

ATLAS DURAPLASTIC

TRADE MARK REG. U. A. C. CO.

AIR-ENTRAINING PORTLAND CEMENT

MAKES BETTER CONCRETE AT NO EXTRA COST

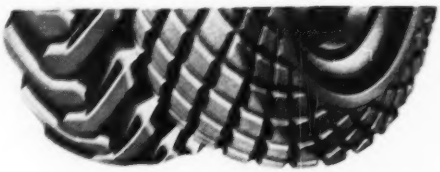
A UNIVERSAL ATLAS PRODUCT

"THE THEATRE GUILD ON THE AIR"—*Sponsored by U. S. Steel Subsidiaries—Sunday Evenings—NBC Network*

As tough as it looks

You can tell at a glance that Goodyear's Hard Rock Lug is super-tough. Those massive lug bars spell super-stamina—that husky self-cleaning universal tread shows rugged pulling power, forward or reverse. But looks don't tell the whole story. For its inner construction is designed to stand up better on any tire-ripping, tire-bruising job. There's an extra-thick undertread to protect the rugged carcass against bruising—the lug bars armor tread and sidewalls against cuts and snags. Any way you look at it, Goodyear's Hard Rock Lug is your best bet for more dependable, lower-cost service on off-the-road tire-killing jobs. Remember, always buy and SPECIFY Goodyear—*it pays!*

A RIGHT TIRE FOR EACH JOB



EARTH MOVER SURE-GRIP
for maximum traction on drive wheels

EARTH MOVER ALL-WEATHER
for drawn vehicles and general traction

Sure-Grip, All-Weather—T. M.'s The Goodyear Tire & Rubber Company

If you think you'll like "THE GREATEST STORY EVER TOLD"—Every Sunday—ABC Network

GOODYEAR

MORE TONS ARE HAULED ON GOODYEAR TIRES THAN ON ANY OTHER KIND

Volume 31 • Number 12

CONSTRUCTION
METHODS AND EQUIPMENT

DECEMBER, 1949

Let's Get Ready

THE ATOMIC ENERGY COMMISSION has just released a report on what would happen to Washington, D. C., in event of atomic bombing. It's not pleasant reading—it brings back the horrible memory of how Nagasaki looked to us shortly after V-J day. The report dwells at length on probable damage to both structures and citizens, then goes into rescue phases of an attack. In no uncertain terms it points out that rescue work would have to be carried on from the outside. But by whom and how?

If national defense is to mean anything it must make us ready to face any emergency. Atomic bombing is only one of several possible disasters—regular bombing, and wholesale sabotage are likewise possible in event of war. Washington is but one likely target—every city and industrial community is a potential sufferer.

Terrible as a war-borne disaster might be to any of our cities, it would be doubly terrible if we were caught unprepared, unorganized and helpless to carry out rescue operations, to open up thorofares or to effect emergency restoration of vital facilities. Therefore, the construction industry must be organized and prepared to act in case of a major catastrophe. It is the only source of equipment, men, materials and know-how capable of handling results of war brought to our doorsteps.

As A.G.C. ex-president Dwight W. Winkelman pointed out in a speech on the subject before the American Society of Civil Engineers last month, much already is being done in planning for the construction industry's place in national defense. But no half-way measure will suffice. Every contractor association chapter, every equipment distributor organization and every highway maintenance group must be alerted, organized for any emergency at home or some distance away, and instructed in advance as to cooperation with military, relief and civic authorities. The U. S. Corps of Engineers, through its centralized division and district offices, is the logical agency to coordinate the mobilization of the construction industry for emergency action.

Millions of Americans touched by the last war hope and pray that war will never come again. But if military disaster should hit our land, let's be ready to marshal the mighty forces of construction at a moment's notice. Lack of such preparation is sheer stupidity.

Merry Christmas

★

LET'S FORGET atomic bombs and national defense and wars long enough to celebrate the birth of the Prince of Peace, whose simple teachings, if followed, would bring peace to a troubled world and to the hearts of harassed mankind. Our own Spike Hennessey, portrayed below, speaks for the entire staff in wishing our readers, advertisers and other friends a Very Merry Christmas and Happy New Year. Peace on Earth to Men of Good Will!

Rich

ON THE COVER—*Bright Sentinels* standing against Colorado's blue sky are main columns of the new Arapahoe steam power plant being built by Ebasco Services, Inc. for Public Service Co. of Colorado in Denver. John Beasley, erection subcontractor, is setting the columns with a Lima crane. He developed a neat offset hitch to hold the columns plumb for dropping over anchor bolts, as outlined on page 102 of this issue. Don Long, Denver photographer, took the cover shot.

Spike Sez: Howdy, folks, and 'tis all of you I wish the Merriest Christmas you ever had. May 1950 bring each and every one of you peace, health, happiness and prosperity.

CONCRETE OPERATIONS at Hungry Horse Dam start with pouring foundation monoliths at base of left abutment. Cableway head towers are just out of view at upper left. Note depth of overburden removed from sloping rock of abutment.—U.S.B.R. photo

Construction Plans at Hungry Horse Dam

WHEN A COMBINATION of 12 contractors, bidding under the name of General-Shea-Morrison, turned in a low bid of $43,431,000 (exclusion of cement) for the U. S. Bureau of Reclamation's Hungry Horse Dam in northwestern Montana last year, they created a considerable stir in construction circles, for they had apparently left some $9,000,000 on the table, being that low from the next and only bidder. But the successful contractors on the big job aren't worried about their bid. Though never officially announced, it is a well-known fact that the second bidder was so far above U.S.B.R. estimates that they probably wouldn't have been awarded the job at their figure.

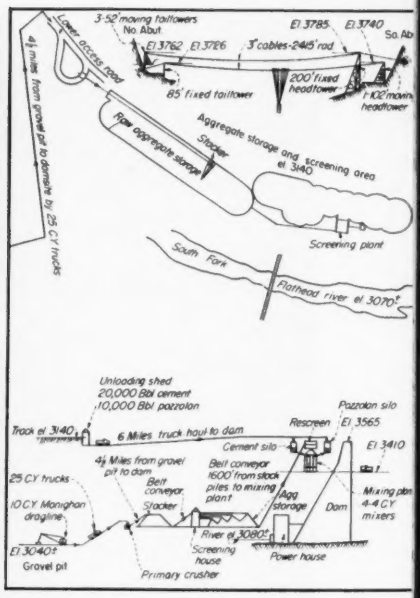
FIRST JOB was to build access roads to both sides of Flathead River canyon, as this aerial shot looking upstream shows. Main high road at left is permanent government-built highway; all others are contractor-built for job.—U.S.B.R. photo

General-Shea-Morrison assured the success of the venture by naming General's C. W. (Smoky) Wood as project manager. Fresh from Ross Dam, Smoky is recognized as one of America's great dam builders, along with such capable characters as Frank Crowe, Clay Bedford, Edgar Kaiser and Harvey Slocum—to mention a few. They further clinched the job's success by taking a year in preliminary operations and to set up one sweet dam-building plant to convert 2,900,000 cu.yd. of concrete into the world's third highest concrete dam—564 ft.—topped only by Hoover and Shasta Dams. This fall they turned out some 50,000 cu.yd. of concrete just to shake down the aggregate and concrete plant and to get ready for million-yard pours the next three construction seasons, which average less than seven months in that mountain climate.

Hungry Horse Dam, a combined flood control, irrigation and power project, lies in the deep canyon of the South Fork of the Flathead River, 5 mi. above the junction with the North Fork and 12 mi. south of Glacier National Park. To accommodate the 2,900,000-yd. mass of concrete in the arched gravity dam required excavating 900,000 yd. in the foundations and canyon wall stripping. Cofferdams, roads and plant preparation involved another 400,000 cu.yd. of exca-

BOTH MEN AND MACHINES are tied to safety lines in stripping steep right bluff. These Chicago Pneumatic wagon drills are equipped with hand winches for moving them up and down slope.—U.S.B.R. photo

IMPROVISED SLACKLINE CABLEWAY with winch on Caterpillar tractor for power cleans up loose rock at toe of slope, keeping workers out of falling rock danger zone. Bucket moves rock from steep banks to within reach of shovel at bottom.—U.S.B.R. photo



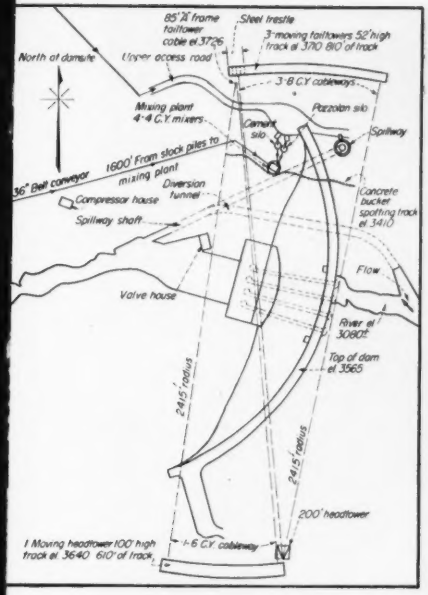
GENERAL PLANT LAYOUT at Hungry Horse Dam shows location and relative position of four cableways, mixing plant and

vation. The structure will create a reservoir of 3½ million acre ft. Ultimate power installation will be 286,000 kw.

An innovation in mass concrete construction will be the mixture of pozzolan (fly ash) with portland cement at the mixer. One part pozzolan will be blended with two parts of cement. The fly ash will be supplied in bulk by the Commonwealth Edison Co. from its Chicago power plants. Concrete will be cooled by 35-deg. water from a left-bank creek pumped through 3,600,000 lb. of tubing buried in the mass, similar to the scheme first used at Hoover Dam.

A diversion tunnel was driven through the right bluff under a previous contract. As part of the preparation work, a 955-ft. glory-hole spillway tunnel connecting with the diversion tunnel has been completed (CONSTRUCTION METHODS AND EQUIPMENT, Nov. 1949, p. 48).

The dam, 564 ft. high, will have a crest 2,115 ft. long on a 1,200-ft. radius. Possibilities of concrete placement from a trestle were analyzed, but the contractors ruled out this method because two trestles at different levels would have been necessary to take care of the dam curvature. Therefore, a layout of four cableways with uniform 2,415-ft. spans in two separate

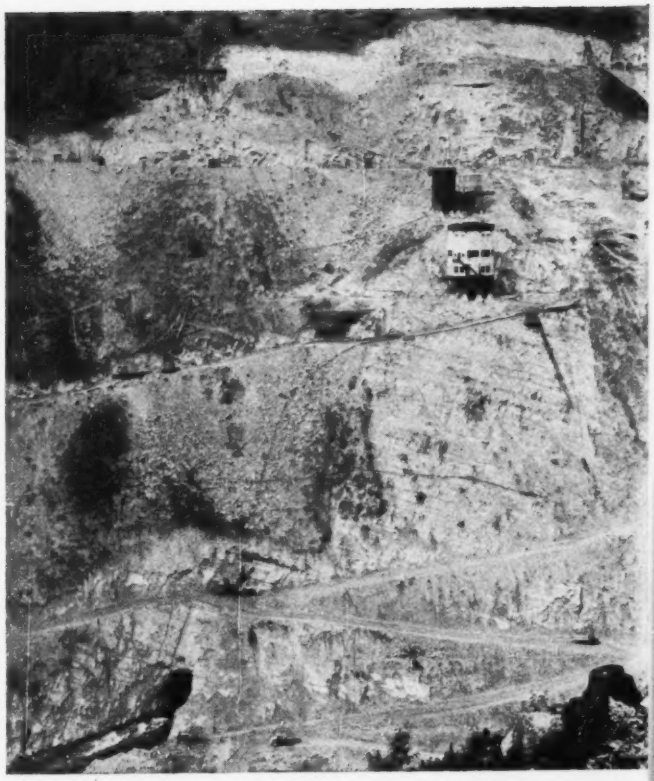


aggregate plant. Details of each will be covered in subsequent articles. Big job is 6 mi. from nearest rail siding.

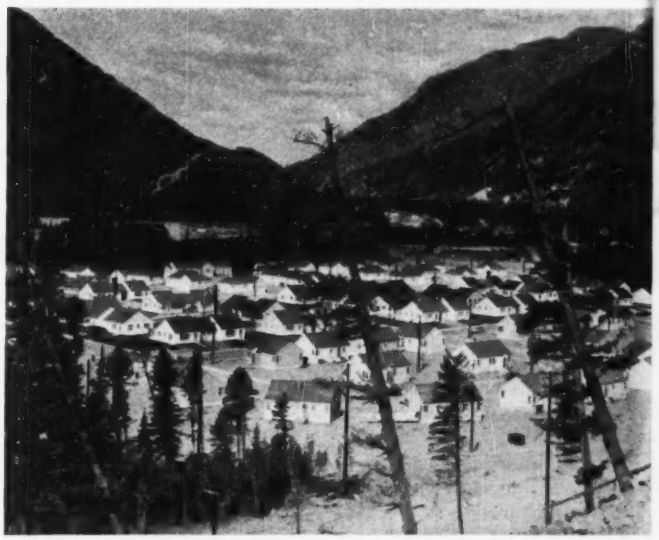
systems was adopted, admirably suited to the steep canyon terrain.

At the site, the river flows westward. The upstream cableway consists of a 200-ft. fixed head tower on the south bank, serving three traveling 52-ft. tail towers on 810-ft. track on the north bank. These units can handle 8-yd. Crowe two-line (self-dumping) concrete buckets. Immediately downstream from this multiple system is a single cableway with a 100-ft. traveling head tower on a 610-ft. track on the south bank and an 85-ft. fixed tail tower on the north slope. This unit, which will largely serve the powerhouse and left abutment areas, is limited in capacity to 6-yd. concrete buckets. The plant layout, with elevations, is shown in the accompanying drawing.

High on the north bank is the mixing plant containing four 4-yd. Koehring mixers (a fifth unit is now being installed), a Johnson batching plant, aggregate rescreening plant and cement and pozzolan silos. Cement and pozzolan haul from the Great Northern railhead at Coram, 6 mi. away, is by special body Euclid trucks over a government-built road that will eventually cross the dam crest. Processed aggregate is lifted 410 ft. from the aggregate plant on the canyon floor downstream from the dam over a 1,600-ft. belt conveyor



MIXER PLANT takes shape high on right bluff above diversion tunnel outlet. Bench just above cement and pozzolan silos is main access road; highest bench is cableway runway.



A NEW TOWN—Hungry Horse, Mont.—springs up on Flathead River flats below the dam. This is government office and housing area. Close to Glacier National Park, not a bad place to spend the summer—but winters are plenty tough.

ABUTMENT STRIPPING was carried on last winter, despite unusually cold weather. Here is view of left abutment as switchback access roads were being built. Lighting system is hung from cable and can be reeled in for maintenance—U.S.B.R. photo

to the mixing and batching plant.

Details of the cableways, concrete mixing and placing operations, and aggregate production and processing will be covered by articles in subsequent issues.

The original specs called for obtaining all aggregates from the riverbed upstream from the dam. Because water storage will start long before the dam is completed, this would have required the storage of some 1,000,000 cu.yd. of sand and gravel above reservoir level —an expensive and troublesome procedure. In making up their bid, General - Shea - Morrison investigated a river gravel deposit 14 mi. downstream and were so convinced of the suitability and availability of the material that they figured on this source. After the contract was awarded, the contractors located a beautiful gravel deposit at the junction of the two forks, less than 5 mi. below the dam. This material (5,000,000 yd. in sight) proved satisfactory to the U.S.B.R. and is now being produced from a 95-acre tract bought by the contractors. Here a 10-yd. Monighan walking dragline is excavating the sand and gravel and loading into 25-

LARGELY RESPONSIBLE for construction of Hungry Horse Dam are Clyde H. Spencer, (top), construction engineer for U. S. Bureau of Reclamation; Smoky Wood (center), project manager and Dick Jones (bottom), chief engineer for contractors, General-Shea-Morrison.

CONSIDERABLE OVERBURDEN on left abutment is sluiced down by hydraulic jets under 240-lb. pressure. Northwest shovels load debris into Euclid trucks for disposal. Steeply sloping, tight ledge makes ideal abutment foundation.

yd. Euclid trucks for haul to the processing plant at the dam.

A 40-ft. road with wide, sweeping curves and low grades has been built for fast haul of aggregates from pit to plant. This road surface is water-bound macadam on a minimum base of 3 ft. of gravel. The water-bound top was selected as easiest to maintain.

At Coram, 6 mi. from the dam, is a railroad yard, unloading platforms and a 30,000-bbl. cement-pozzolan unloading and storage shed.

Two separate, but adjacent, communities built by the U.S.B.R. and the contractors on the flats below the canyon outlet form the new town of Hungry Horse. Here the contractors spent more than 1½ million dollars for temporary offices, housing and shops. Repair facilities include a completely-equipped shop big enough to accommodate a Northwest 80D shovel. A central compressor plant near the dam houses six new Chicago Pneumatic electric-drive compressors turning out 7,100 cfm. at 105-lb. pressure. The air receivers are built around the after-coolers

(Continued on page 92)

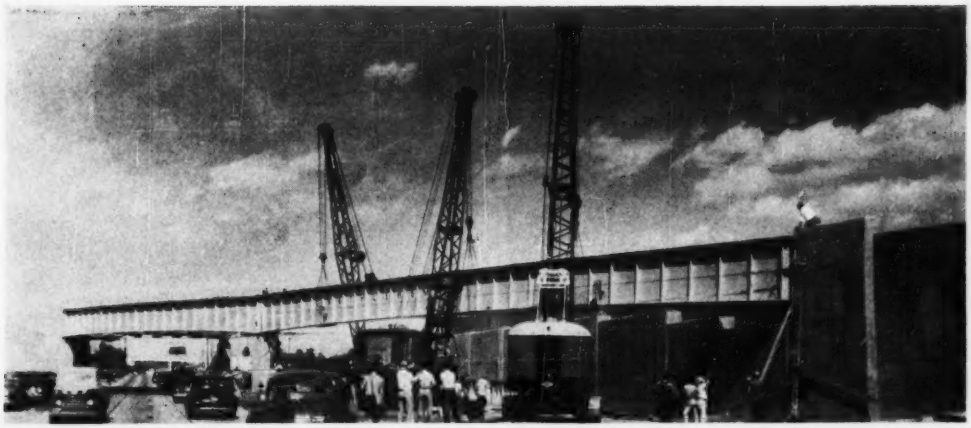
CEMENT, SAND, AGGREGATE and water trucks gang around this huge mixer on paving of 3.4 mi. of Route 4 from Inman Ave. in Woodbridge Township. Union Building and Construction Corp. of Passaic is handling the job, which is first section repaved with aid from Bureau of Public Roads. Note portable generator in foreground for electric vibrator.

New Jersey Uses Big Equipment for Big Jobs

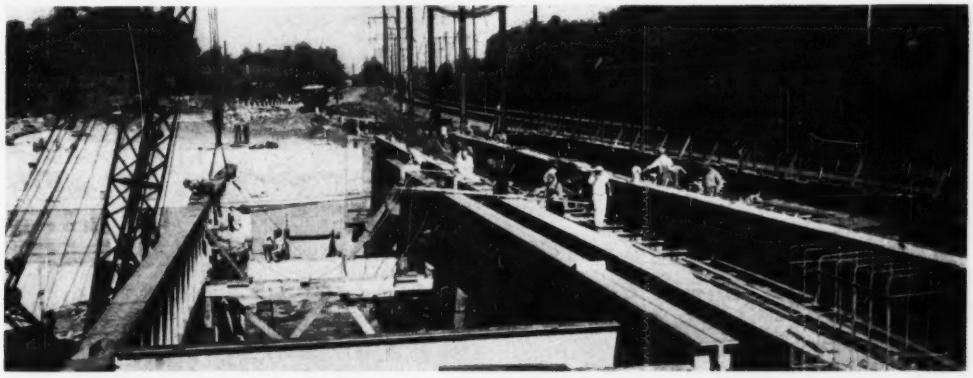
CLEAR SHOT OF PROCEDURE involved for placing retaining wall in depressed section on Trenton Freeway. Franklin Contracting Co. of Newark used their P&H rig at left to drive sheetpiling, later to clamshell hole, and finally to backfill.

THE STATE HIGHWAY DEPARTMENT in New Jersey is really buzzing these days with all kinds of diversified road jobs and all kinds of equipment to expedite them.

Shown here are five progress photos taken at random from their files showing the vast improvements being made to the state highway system.



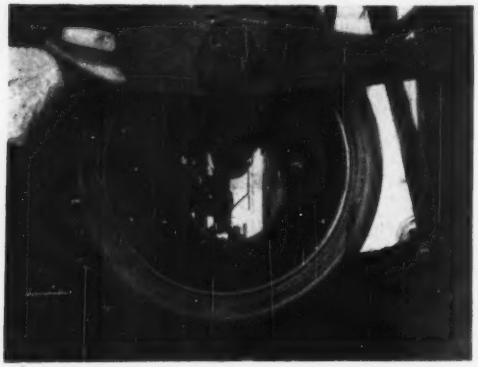
TEAMWORK! COMBINED EFFORTS of Lorain, Bucyrus-Erie and Lima cranes place a 153-ft. girder for Route 4 Parkway overpass of Route 35 in Woodbridge Township, Middlesex County, N. J. Villa Contracting Co., of Westfield, is contractor.



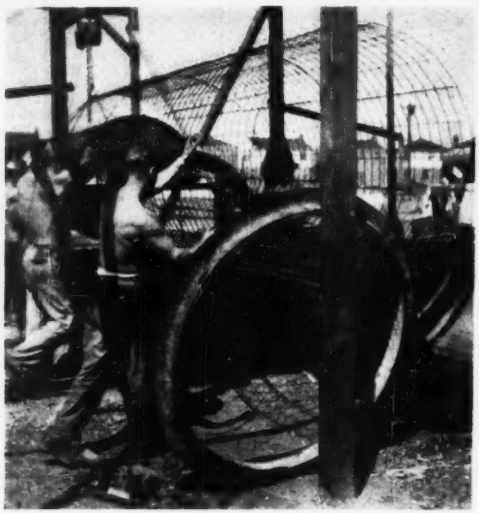
MAIN-LINE TRAINS on Philadelphia-New York run past undisturbed as tracks are shored in preparation for new piers on underpass where Route 4 passes under four-track bed and parallel Route 27. Meanwhile, an 80-ft. section of bridge is assembled on both east and west sides. Set up on rollers, they were moved into place and connected at a time when train traffic was at a minimum. Brann and Stuart Co., of Philadelphia, who have contract for underpass, made moves on Sundays when traffic is lightest.

OUTDOOR LABORATORY is name given to this 4½-mi. section of divided roadway on N. J. Route 25 (U. S. 130). Six different sections will be tested and closely watched in two-fold plan to save lives and determine best design for low-cost roads. Here contractors' forces are laying bottom course to be followed by blacktop. Entire test section is 4½ mi. long and is now nearly completed.

Roller compaction of core is first of two new processes that join in . . .



Making Unique Prestressed Concrete Pipe



1 PRE-TIED CAGE is placed in casting mold to reinforce concrete core of 54-in. x 16-ft. prestressed pipe designed for 108-psi. pressure or 250-ft. hydrostatic head. Cage is 4x8-in. mesh of No. 4 and No. 7 wires.

4 CASTING MACHINE has triple-purpose rotating spindle that: (1) Supports mold during pour; (2) turns mold at 60 rpm. through friction between spindle and inner edge of end rings; and (3) compacts concrete into dense-walled core.

PIPE DETAILS

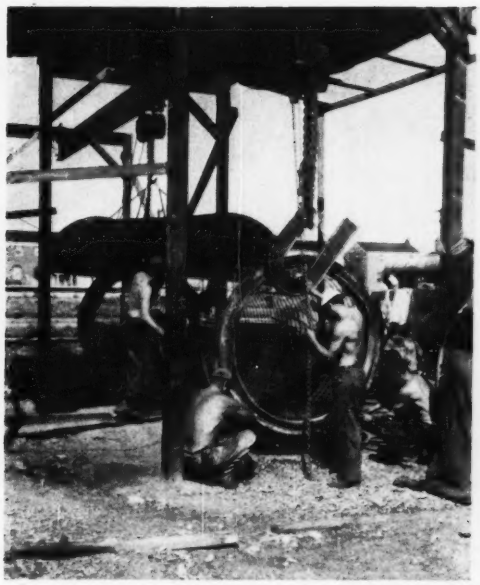
Size: 54 in. by 16 ft. Design Pressure: 108 psi.; 250-ft. head

Type	102	103	104	105
Core wall thickness (in.)	3	4	4	3
Number of spirals per set	30	41	58	69
Pitch of spirals (in.)	16½	17¼	17¼	86
Wire per pipe (lb.)	635	855	1,210	302

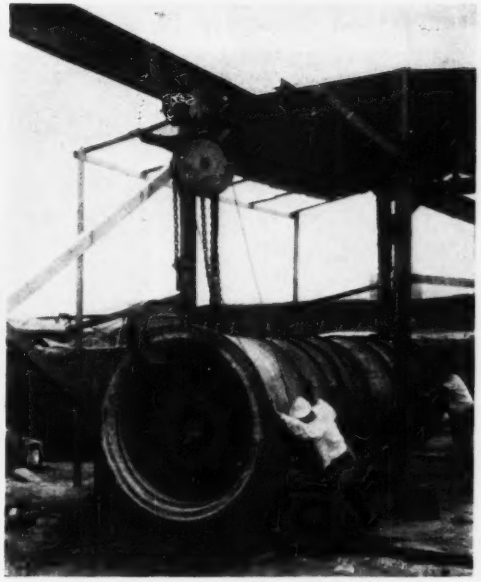
PIPE CHARACTERISTICS are varied to meet field conditions. First three types rest on concrete bed under cover varying from few feet (for Type 102) to 37 ft. (for 105). Type 105, supported in open on piles beneath bells only, has long-pitched spirals for greater longitudinal prestress so pipe can act as beam.

MORE THAN THREE HUNDRED 16-ft. lengths of 54-in. prestressed concrete pressure pipe are being made in Chicago, then trucked to a job site 300 mi. away. Though the long haul is unusual, the pipe itself is unique. It has an inner core of concrete centrifugally cast by a roller suspension method, and it is prestressed by a basket-weave wrapping of high-tensile wire.

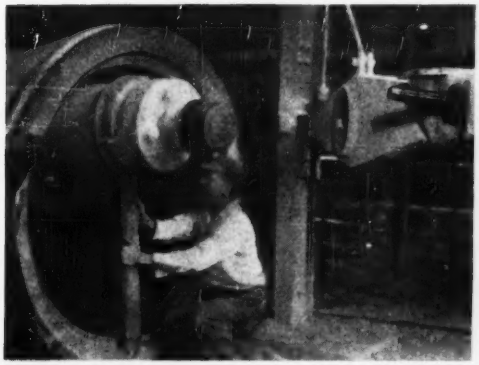
Casting and prestressing processes are both new. The former involves suspension of a steel mold from a horizontal roller so concrete is squeezed between them as they rotate. With this rolling technique, a dry mix (only 10 gal. of water to 3 sacks of cement) is



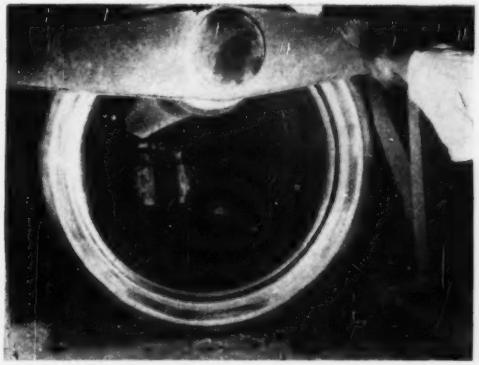
2 CAST STEEL END RINGS and other half of mold are assembled around reinforcing and bolted in place. Mold is of ¼-in. steel with ½x1½-in. circumferential stiffeners; weighs 4,500 lb. empty.



3 COMPLETED MOLD is moved from "core curing, stripping and mold assembly" track to parallel "ready for pouring" track to be rolled to casting shed. Track rails are steel channels laid flat on timber sills and end-clamped through webs.



5 MOLD IS THREADED over spindle while supported by chain falls. Hinged bearing will be swung shut to support end of spindle as mold turns and core is poured. The 54-in. pipe is largest ever made by roller-suspension process.



6 SPINDLE TURNS MOLD and rolls concrete into core as 8-in. by 27-ft. belt conveyor dumps mix along pipe bore. Conveyor is offset toward descending side of rotating mold, which is supported by spindle only.

(Continued on p. 60)

successfully poured and compacted to make a pipe core of dense, strong concrete (close to 167 lb. per cu. ft.; 8,000 psi. minimum compressive strength).

For prestressing, the cured concrete core is turned about its central axis and wire is wrapped around spirally in both directions to form a basket weave design. Thus, the pipe is prestressed longitudinally and circumferentially at the same time.

Accompanying step-by-step photographs show the manufacture of the new pipe. It is for a 5,200-ft., $500,000 water line relocation on the Corps of Engineers' Chain of Rocks Canal project along the Mississippi at Granite City, Ill.

General contractor for the relocation is River Construction Corp., New York. Preload Central Corp., Kansas City, is sub-contractor for pipemaking. F. B. Spencer is general manager and R. J. Dunlap is construction manager for River Construction, while Tom Chiverton is plant boss for Preload Central. Lt. Col. Paul La Due is resident engineer under Col. R. E. Smyser, Jr., district engineer at St. Louis.

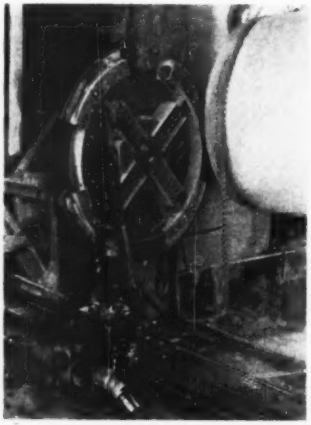
The pipe was designed by Preload Enterprises, Inc., New York. They have patented the basket-weave prestressing, and are licensees for the roller suspension casting process, which was developed by Rocla, Ltd., an Australian firm.

Prestressed Concrete Pipe...continued

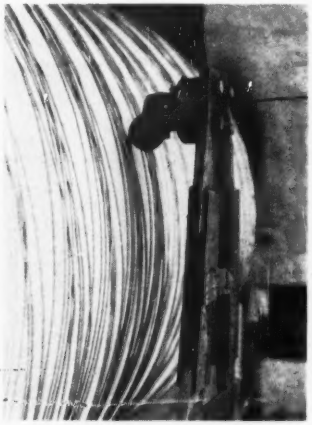
7 CONVEYOR CANTILEVERS into pipe and is moved by hand winch to place concrete where wanted. Note stiffness of concrete on belt and multiple V-belt to roller spindle from 30-hp. electric motor.

8 EACH BATCH HAS 600 lb. ¾-in. aggregate; 200 lb. ¼-in. aggregate; 200 lb. coarse sand; 23 lb. fine sand; 3 bags cement; 10 gal. water. Minimum strength is 8,000 psi; 28-day cylinders test up to 10,700 psi.

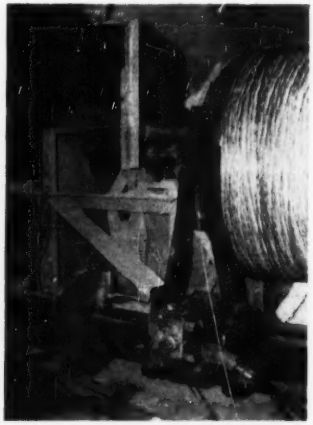
9 AT END OF POUR, which takes about ½ hr., dry sand-cement mixture is thrown in rotating pipe to give interior surface finish. Completed core will be removed from spindle and steam-cured over night.



12 WIRE-WINDING MACHINE has headstock, driven by 25-hp. electric motor, that expands within pipe to grip and turn it at 20 rpm. Pins in end ring will anchor prestressing wire.



13 TURNING PIPE pulls high-tensile prestressing wire through device at top of carriage arm to reduce its diameter and stress it to 140,000 psi. Carriage moves back and forth along turning pipe . . .



14 . . . SO PRESTRESSING WIRE has basket weave pattern. Carriage speed is adjusted to give correct pitch to spiral winding, which splits prestress into required circumferential and longitudinal components.

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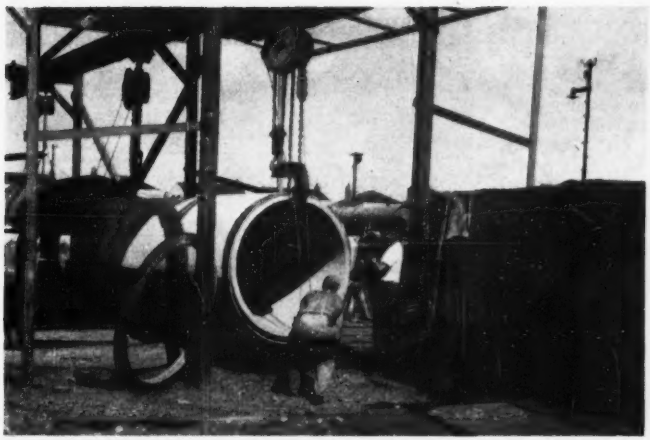
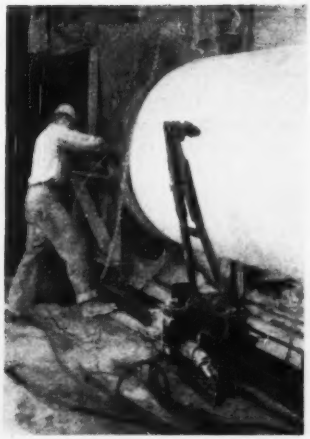
17 AFTER GUNITING, pipe is racked and steam-cured inside portable canvas "doghouses." At left, is one of hinged frames that are swung up to support heavy pipe, which weigh up to 16,000 lb. Prestressing saves dead weight, cuts down amount of reinforcing and concrete, prevents concrete cracks, makes piping self-supporting when necessary and is cheaper.

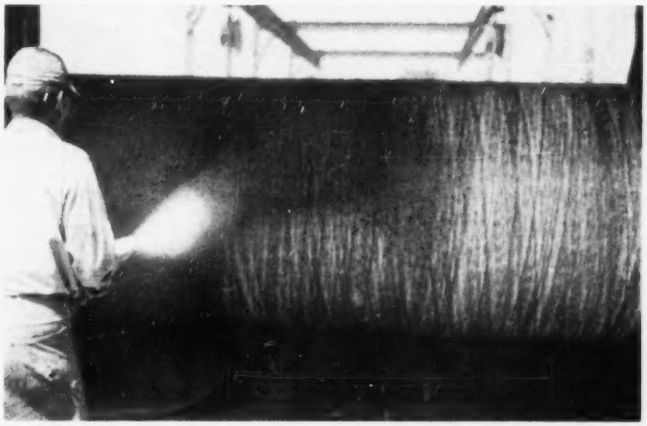


10 CORE IS STRIPPED from mold, inspected inside and out, and moved to steaming area. Band embedded around spigot is steel joint ring to be replaced by rubber-gasket pipe joint. Core will be moved to canvas enclosure at right for further steaming which hurries the curing of concrete.



11 CURED CONCRETE CORE is fitted into lathe-like wire-winder. Hydraulic-powered carriage riding beam-rail alongside pipe will feed prestressing wire to core for second step in process.

15 PRESTRESSING WIRE is No. 8 cold-drawn high-carbon wire with 175,000-psi. yield point and 200,000-psi. ultimate strength. Here, new coil is started, fastened to old with standard wire-splicing torpedo.



16 PRESTRESSED PIPE is Gunited while still in wire-winder which is geared down to 2 rpm. Protective ¾-in. cement mortar coating fills behind and around overlapping spirals to give ultra-strong bond.

18 COMPLETED PIPE, treated inside with asphaltic membrane seal coat, is loaded on semi-trailer for 300-mi. haul from Chicago yard to Granite City job site. Two lengths make full load. In all, 302 pieces of 54-in.x16-ft. pipe plus 34 specials were shipped this way for 5,200-ft. water line. Pipe for Chain of Rocks job is first application of new prestressing technique.

How to Ruin a Truck Crane ...in One Easy Lesson

RIGHT IN MIDTOWN New York we found perfect examples of how *not* to handle a truck crane (or any expensive piece of construction equipment for that matter) and how *not* to pass lumber on a multiple-story office building job. Fortunately, nobody was hurt at either location, but the workmen and their supervisory personnel are walking on mighty thin ice. They would all do well to read and heed our Safety in Construction series ending in this month's issue.

2 . . . SNAP! BUCKET crashes to ground, front wheels drop with a thud, and parted wire rope knifes through air. The fact that lots of sidewalk superintendents are standing by adds to excitement. But now . . .

1 NEVER MIND the outriggers—they're just there for added weight. Get a good grip on something and snap clutch for all it's worth. Lift front wheels high in air. Then before you know it . . .

3 . . . LET'S HURRY UP and change rope before we have a line of trucks waiting for us. Results: needless delay, damage to equipment, and possible personal injuries. Let's be careful from now on, shall we boys?

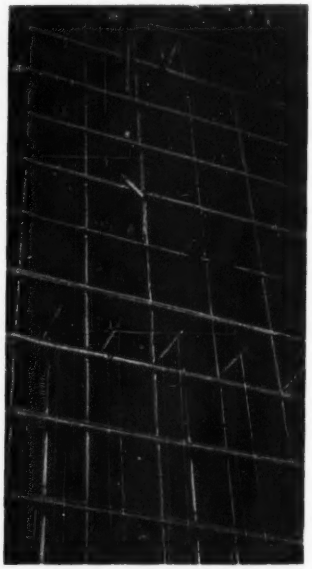
NEXT LESSON...
How to Endanger Workmen and Public

←

1 UNDERSIDE of 11th floor has been stripped. Now to get lumber from 10th to 14th floor. That's easy—just pass boards up on outside of building two at a time. To make matters worse, bricklayers and tenders on scaffold below have no plank cover since they're jacked up tight under outriggers at first setback.

→

2 ALL SET ON that side? Let's move over to one of New York's busiest Avenues and repeat job. Here brickies are covered, but John Q. Public and all motorists down below are not. We know several old-time labor bosses and master mechanics who will cringe when they see these shots.



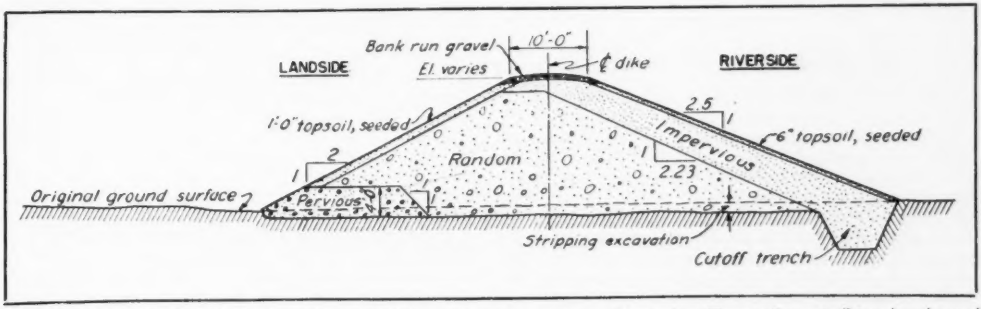
CONTINUOUS LINE OF Euclids brings in fill for 12,900-ft. dike protecting lowland section in West Springfield, Mass. Only breaks in wall are where three main roads enter area. Here retaining walls are set up and stop log materials stored.

Soup-Bowl Dam Keeps Floods Out

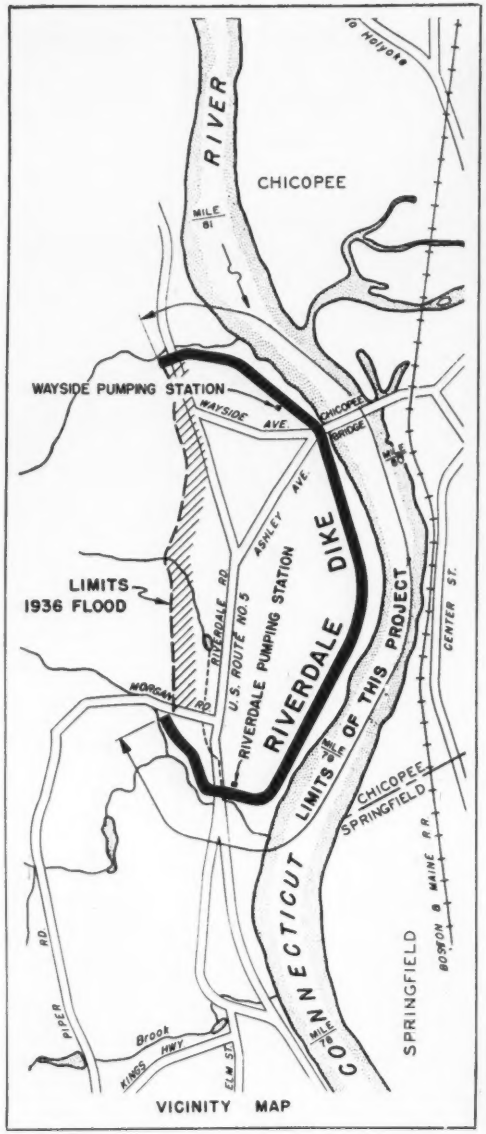
THE ARMY ENGINEERS refer to the project as the Springfield Dike, but the construction stiffs call it a ring levee or a soup-bowl dam because of its encircling effect. Regardless of the name, the 12,900-ft. rolled-fill earth dike will be a welcome sight to the residents and business men of West Springfield, Mass. The area has been severely inundated by floods in the past and boasts productive farmland as well as an open air movie, filling stations, dairy center and airport.

One-third of the soup bowl is formed by natural high ground and the remaining two-thirds by the dike, except for three breaks where highways enter the low area, as shown in the drawing. At each break, the dike ends abruptly at a concrete retaining wall, and begins with another across the road. Stop log barriers can be thrown up across the roads in time of floods, and the entire area will be sealed off.

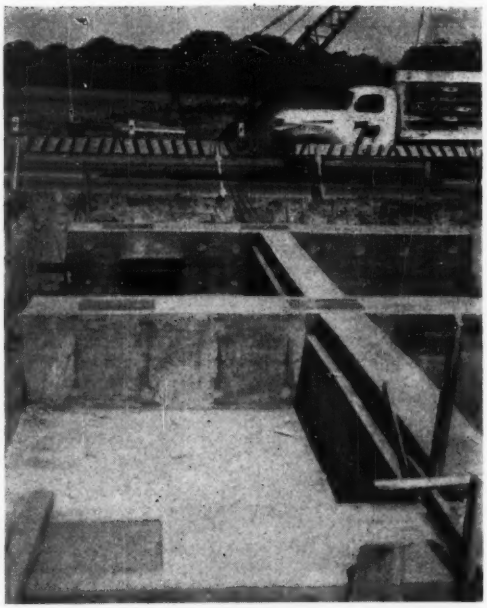
The stop log arrangement is unique. Across each of the three road entrances a line of interlocking sheetpiling is driven along what would be the center-line of the dike and is continued under the retaining walls and well into the earth dike to prevent seepage



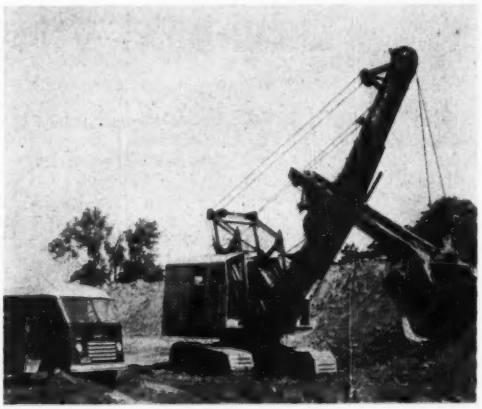
TYPICAL CROSS SECTION of dike shows slope and thickness of random, pervious and impervious fills as well as cut-off trench and gravel road which runs along top.



VICINITY MAP SHOWS location of stop logs, pumping stations and points where earth-fill dike meets existing high ground. Series of relief wells line south section of dike.



CONCRETE STRIP across road entrances sits on line of interlocked sheetpiling, driven to prevent seepage under road. Aluminum structural H-sections can be bolted to clip angles in manholes along strip. Aluminum stop logs can be inserted and entire wall braced back to angles in manholes at end of concrete fins.



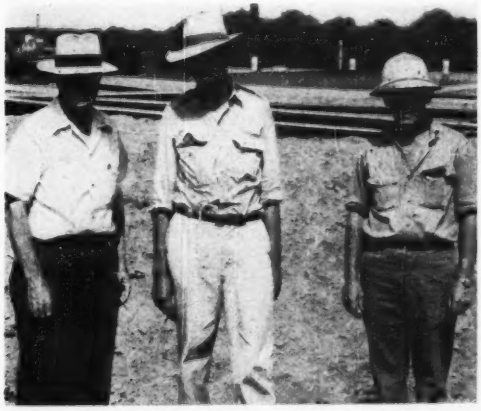
FULLY-EQUIPPED MAINTENANCE TRUCK stops near 2½-yd. Northwest on daily trip to rigs in borrow areas. Such regular check-ups increase efficiency and often prevent breakdowns.

under the roadway. A concrete strip is poured across the roads inclosing the top of the sheetpiling, with fins extending from it in both directions every 10 ft. for extra stability. Manholes and covers are placed at the inner ends of the fins and also where they meet the main strip. In time of threatened floods covers will be removed from the manholes, structural aluminum H-sections inserted along the strip, aluminum stop logs dropped into place, and the whole wall braced back to second set of manholes.

Two big problems accompany soup-bowl dams of this type—accumulation of storm waters inside the bowl and water seepage under the dam. These have been counteracted with storage ponds, pump-houses, and relief wells. One storage pond, 174x174 ft. by 8 ft. deep is situated in the north end of the area and the Wayside Pumping Station erected there will throw the rain water back into the Connecticut River.

A similar, but larger, setup known as the Riverdale Station, is located inside the south wall where the

LARGER OF TWO PUMPHOUSES being constructed next to storage pond. Storm waters and seepage will be collected and pumped back into river. During winter months, ponds will be partially flooded to let local children ice skate.



PART OF THE GANG that keeps the job going for D. O'Connell Sons, Inc., Holyoke, Mass. Dick Ahearn, general superintendent; Bill Sauer, earthmoving boss; and Carl Andros, labor foreman. Everett J. Steed is resident engineer for Corps of Engineers.

earth fill is highest and the largest head of flood waters is anticipated. Its pool will also collect seepage or drainage admitted through the vitrified clay toe drains or through the line of sand-filled foundation relief wells which have been sunk there. These wells will prevent any possible blow-outs and consequent movement of earth below the dike.

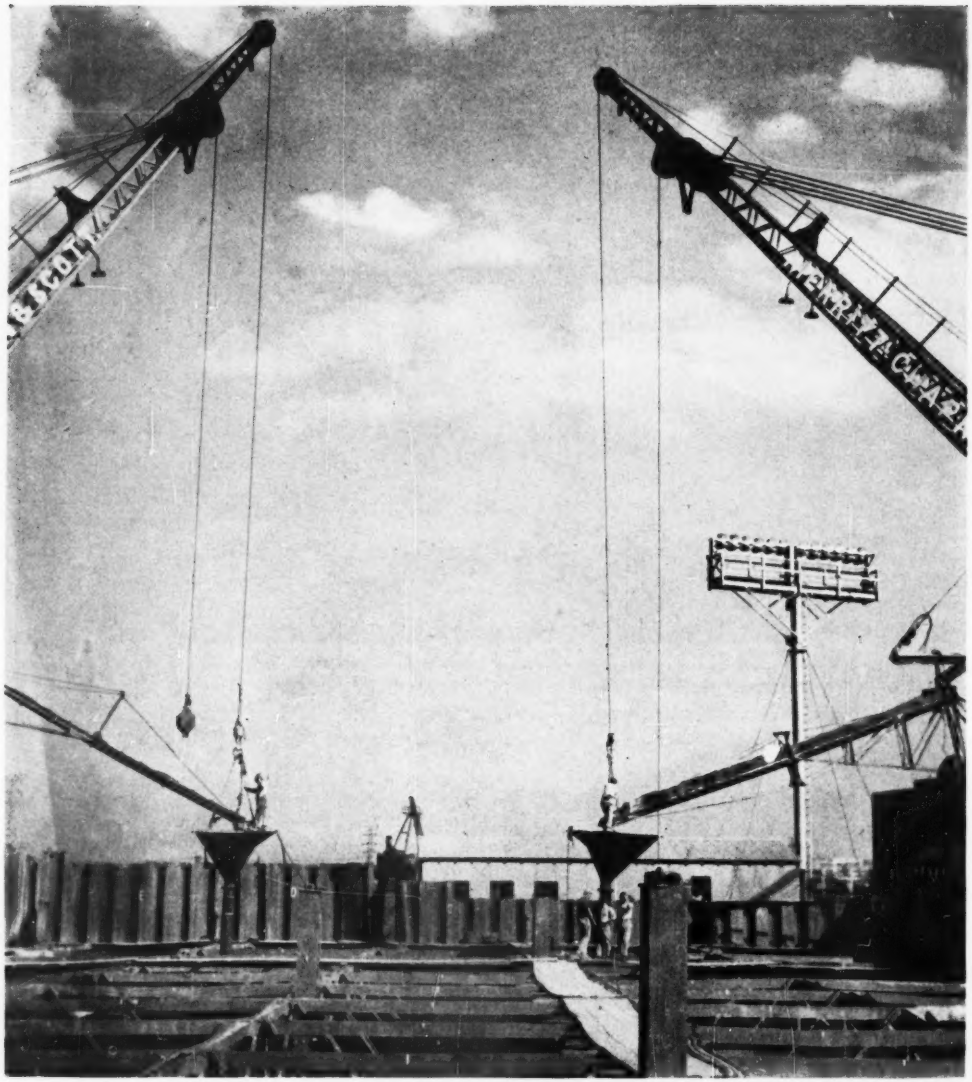
About 100,000 yd. of random fill will come from excavations on the site, but the remaining 300,000 yd. of pervious, impervious and random are being brought in from various borrow areas over company-built haul roads. Topsoil, which was removed and and stored at the beginning of operations, will be spread on slopes and seeded at the end of the job. A completely equipped maintenance truck makes a daily round covering all shovels, Euclids, trucks, graders, etc.

Dick Ahearn is general superintendent for Daniel O'Connell Sons, Inc., of Holyoke, Mass. Some of his helpers are Bill Sauer, earthmoving boss, Ted Zavorsky, project engineer, and Joe Beausoliel, building superintendent. The job is supervised by the New England Division of the Corps of Engineers, and Everett J. Steed is resident engineer with G. P. Sweeney as his assistant.

Mechanical Saw-Sharpening Machine

ONE OF THE INTERESTING exhibits at the Scottish Industries Exhibition at Kevin Hall, Glasgow, last month was a new mechanical saw-sharpening machine. Manufactured by H. A. McQueen and Co. of Glasgow, it is claimed to be revolutionary in its methods of sharpening all types of saws. Handling types ranging from 6-in. to 6-ft. diameters, it can be altered quickly from circular to straight saw position.

It gullets and tops saws at the same time and is flexible enough to grind any compound tooth-angle. The machine is a non-automatic motorized pull-down type. Ball bearings are fitted to spindles and the machine is vibration-free.



Big Scale Planning and a River Full of Mechanized Equipment for . . .

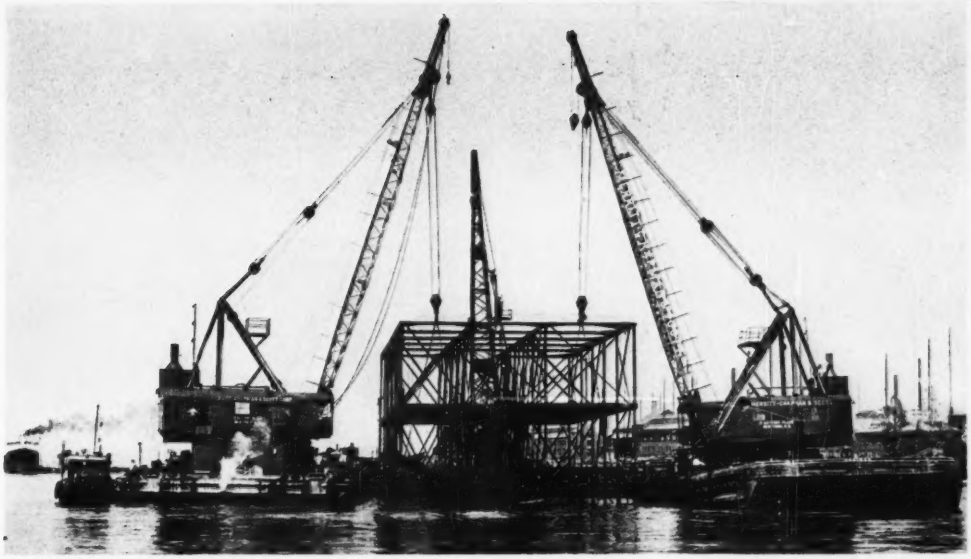
World's Largest Underwater Pour

By JAMES M. CONNOLLY, Assistant Editor

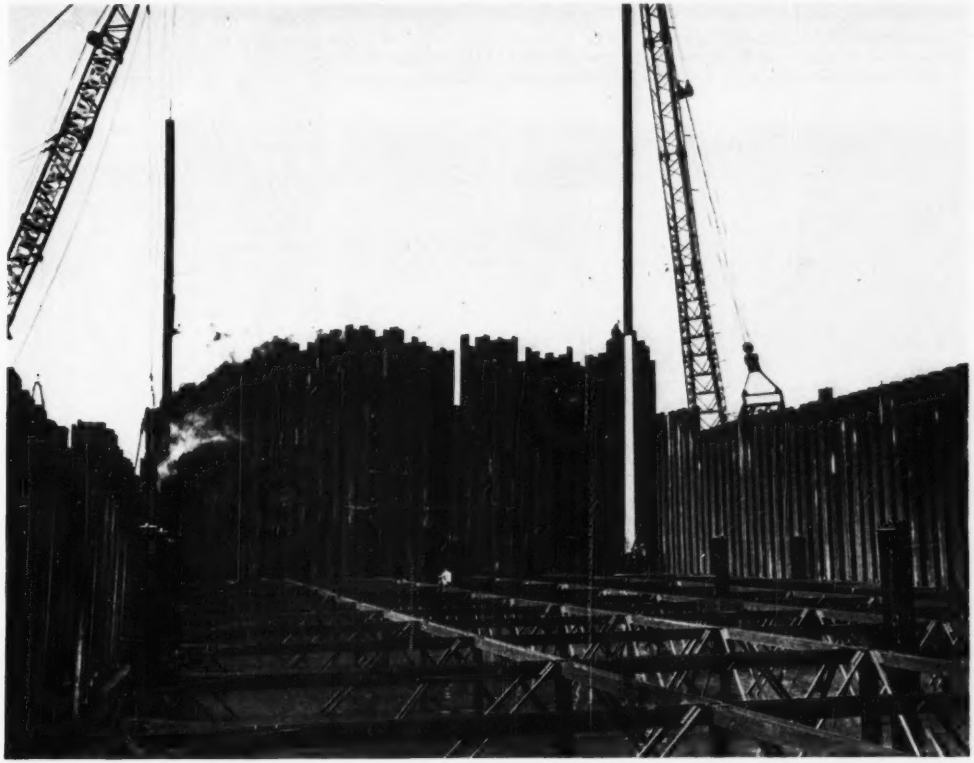
IN THE FUTURE when folks admire the beauty and suspension lines of the Delaware Memorial Bridge, one of the most important parts won't be visible—a 26,888-cu.yd. chunk of concrete at the bottom of the east anchorage. It took a tremendous amount of planning, ingenuity and resourcefulness on the part of Merritt-Chapman & Scott Corp. to complete, without a hitch, the 177½-hr. continuous underwater seal pour out in the middle of the Delaware River.

Original plans called for four open-dredge caissons for tower piers and anchorage foundations on the $40 million suspension bridge, but because of a steel plate shortage the contractor was permitted to use regular cofferdam procedure for the east anchorage.

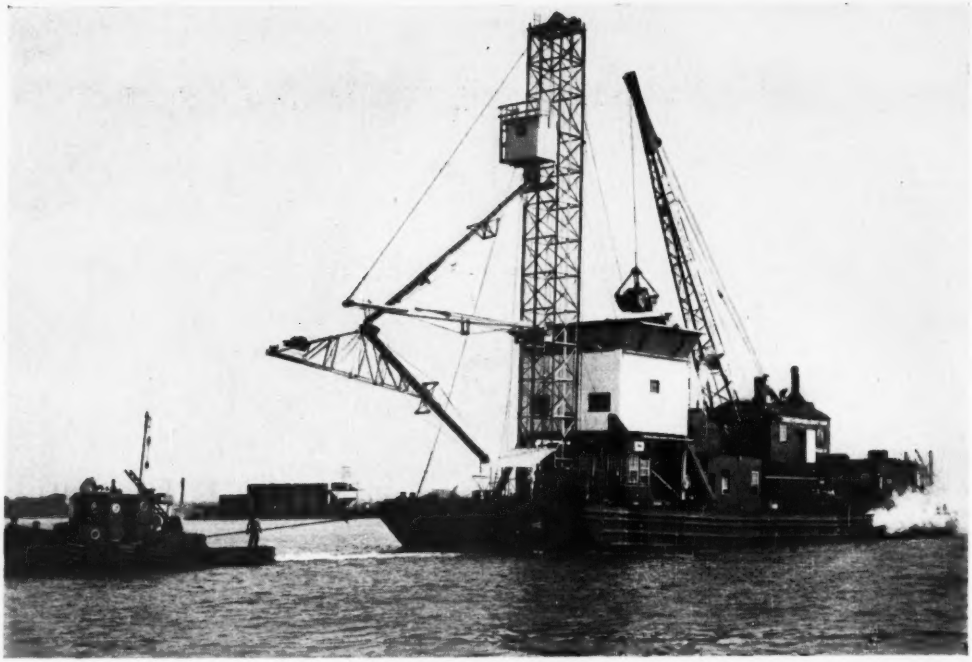
First off, the general area was dredged out to –40 and 24 steel spuds were driven to sub-foundation depth. Through a setup of



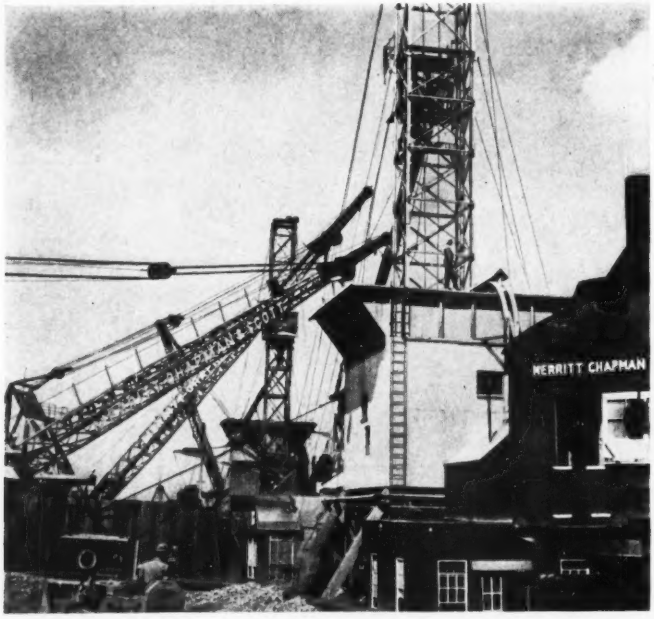
FOUR-LEVEL INTERLACED steel frame was lowered to predredged depth of —40 by cooperative effort of three derrick boats and was first of four such units to form 99 ft. 2-in. x 225 ft. 9-in. cofferdam. Steel served as guide for 100-ft. sections of sheetpiling.



CLOSING PIECE is lowered for driving to practical refusal. Each steel frame unit is hung by cable, turnbuckles and pin to six steel spuds driven far below foundation level. Next cofferdam was dredged to —68.5 founding depth. Manwhile . . .



. . . . DERRICK BOAT "CORTLAND" had been set up as mixing barge and was towed up river for 26,888-cu.yd. continuous tremie pour which took 7 days, 9½ hr. to complete. This mixing barge had two 2-yd. mixers; counterpart had two 1-yd. machines. Then followed aggregate barges, lighting plant, scows, tugs and cabin boats until river was . . .



. . . BEE HIVE OF ACTIVITY and maze of booms. Two more derrick boats hold tremie pipes. Note small Caterpillar tractor piling stone on barge for clamshell bucket. Periodically clamshell picked it up with slings and transferred it to gravel and sand barges for fast efficient cleanup. Also note cement siphon hoses entering top of hopper.

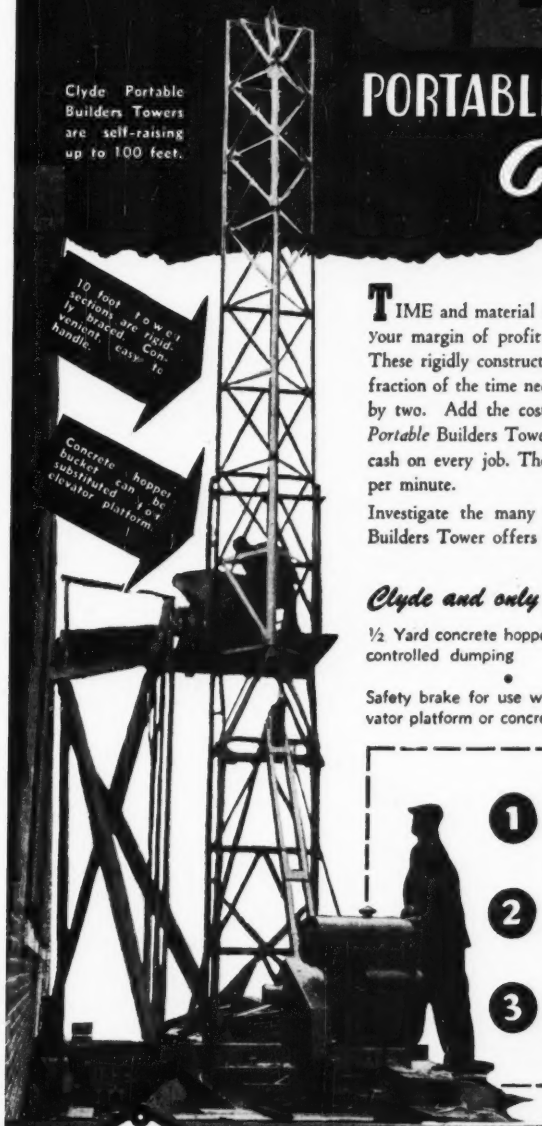
cables, turnbuckles and pins, six spuds supported each of four sections of interlaced steel bracing at elevations +8, −11.5, −26.5 and −41.0. With this done, dredging continued to the founding depth of −68.5 with clamshell and siphon. Meanwhile, using the steel frames as a guide, 100-ft. lengths of MZ38 interlocking sheetpiling were driven to practical refusal inclosing an area 99 ft. 2 in. by 225 ft. 9 in.

Then came the tremie pour and with it all the planning necessary to keep the concrete going continuously from Monday, August 15, at 8:30 a.m. to the following Monday at 6:00 p.m. All that week the river was literally alive with floating construction equipment, efficiently connected to the shore office and to each other with an intricate two-way radio setup.

Heart of the operations were two floating mixing plants: one with two 2-yd. mixers; the other with two 1-yd. mixers. Other equipment included sand and gravel barges on the starboard and port of each mixing plant, water and cement barges, two derrick boats holding tremie pipes, a compressor and floodlight boat, a scow

(Continued on page 73)

Costs Come Down When CLYDE PORTABLE BUILDERS TOWERS Go Up!


Clyde Portable Builders Towers are self-raising up to 100 feet.
10 foot tower sections are rigidly braced. Convenient, easy to handle.
Concrete hopper bucket can be substituted for elevator platform.

TIME and material saved in the erection and dismanteling of towers increases your margin of profit *and Clyde Portable Builders Towers do just that!* These rigidly constructed towers are easily assembled and put in operation in a fraction of the time necessary to erect a costly timber tower. Multiply this saving by two. Add the cost of replacement of timbers on old style towers. Clyde *Portable* Builders Towers save you valuable man-hours and many dollars of cold cash on every job. They handle ton loads and better at speeds up to 178 feet per minute.

Investigate the many advantages and the marked savings a Clyde Portable Builders Tower offers *YOU!* Write today for complete information.

Clyde and only Clyde offers you all these advantages

½ Yard concrete hopper bucket with controlled dumping

•

Safety brake for use with either elevator platform or concrete bucket.

Trailer wheels for towing instead of loading tower on truck.

•

A 2000 lb. capacity tower derrick for extra hoisting service.

1. Tower is **easily** and **quickly** lowered and dismantled for transport. May be loaded on truck or towed on trailer wheels which attach to tower base.

2. Tower is **quickly** and **easily** assembled, and cable reeved while tower is on the ground. Only two men are required to handle 300 pounds 10 foot sections.

3. Tower hoist **quickly** and **easily** raises tower into position. No outside crane is needed. **Clyde Portable Builders Towers are fast, safe, convenient to erect.**

Subsidiary of Barium Steel Corp.

CLYDE

CLYDE IRON WORKS, Inc.

DULUTH 1, MINNESOTA

LOOK TO **P&H**

FOR ADDED VALUES

(Above) A P&H Model 655 (1½ yard). Important features include all-welded construction of rolled alloy steels, low pressure hydraulic control — true tractor type crawler — and many others you can't get in other machines, or, if available, cost you extra.

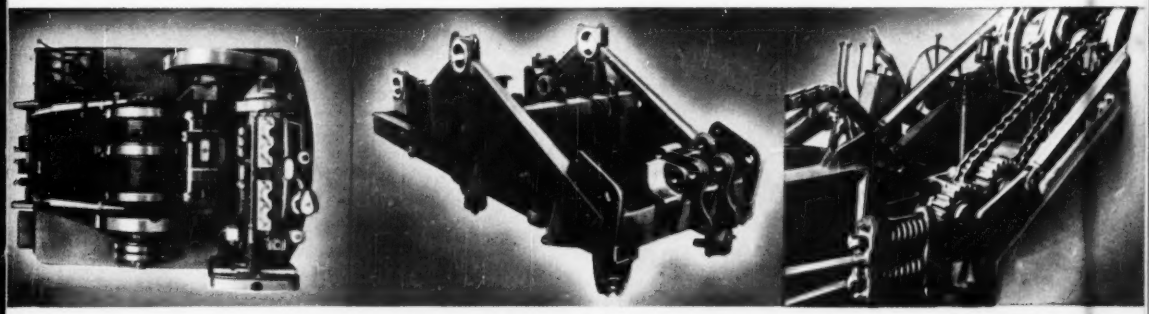
DIGGING POWER

per pound of weight

another P&H added value

Sit at the controls of a P&H and you'll know what we mean. It's *designed* — from crawlers to boom point — to put more *dig* at the tooth point! Deadweight's out! Live weight does it — makes the difference in faster, easier digging. And that means lower costs on any job.

Here are some of the ways you gain maximum capacity in relation to total machine weight:



1. YOU SWING LESS DEADWEIGHT. Machinery units on upper deck are placed far back of center to counterbalance digging end. This trims off hundreds of pounds of clumsy ballast — peps up the swing — reduces strain.

2. YOU CARRY LESS TOTAL WEIGHT. This modern P&H revolving frame weighs only 2/3 as much as old style frames for same size machine. Yet rolled alloy steels, all-welded, make it the strongest for its size ever built.

3. YOU HAVE FULL ENGINE POWER ON EVERY BITE with P&H's planetary chain crowd. It's rapid-reversing—50% faster on retract. Action is smooth, responsive, accurate — you can control it to within 1 inch of grade.

Buy your next excavator on the basis of more digging power per pound of weight. You'll be money ahead — and years ahead — with P&H.

Ask your P&H Dealer to show you the new sound-color film "Added Values." Every excavator user should see it.

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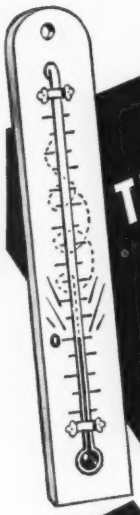
EXCAVATORS · ELECTRIC CRANES · ARC WELDERS · P&H · HOISTS · WELDING ELECTRODES · MOTORS

SEE YOUR P&H DEALER!

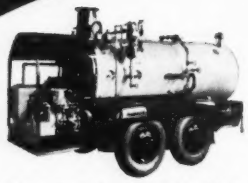
P&H Excavators and Truck Cranes are more easily converted for the various types of service shown below—with hoist and digging drums on one shaft, the need for auxiliary shafts and gearing is eliminated. You also have a choice of gas, Diesel or electric power. Ask for literature on the size you need.



TUMBLING TEMPERATURE TIME IS HERE!

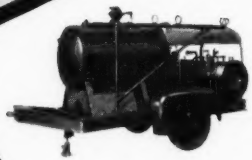
A partial check-list of Cleaver-Brooks equipment for cold weather construction and maintenance!

MOBILE STEAM PLANTS



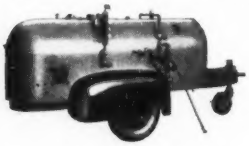
Completely self-contained; portable; highly efficient, fully automatic, code constructed, weather protected; available as skid mounted unit for your truck or trailer. Ideal for pile driving and extracting — 80 to 150 hp, oil or gas fired.

PORTABLE PUMPING BOOSTERS



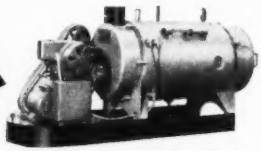
Heats bituminous material 4 times as fast; No. 1 booster — 10,000 gallon car 35° to 45° per hour, No. 2 booster — 10,000 gallon car, 55° to 60° per hour. Available as skid, two wheel or four wheel trailer mounted unit.

PORTABLE TANK CAR HEATERS



Fast steaming; 20 minutes from cold water start to 125 pounds steam pressure. Boiler feed pump, gas engine, oil burner, fuel and water tanks are all mounted on a single frame. 2 car heater — 28 hp; 3 car heater — 42 hp.

HOT WATER GENERATORS



A fast, instantaneous hot water producer requiring no storage tank up to rated output; fully automatic, code constructed, insulated. Two sizes — 665 gph, 100° F. rise and 875 gph, 100° F. rise.

Despite cold and wet weather, construction and maintenance work must go on.

Cleaver-Brooks equipment provides steam, heat, or hot water — fast, efficiently, and at low cost — for a wide range of cold weather needs such as —

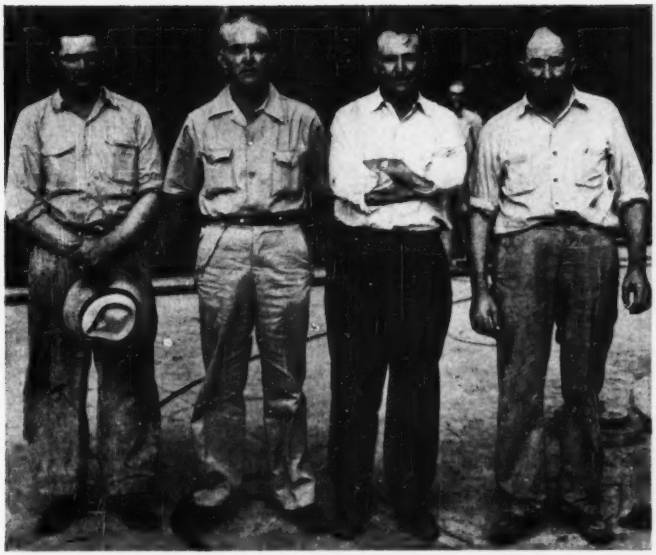
- Steam for cleaning machinery, thawing frozen ground, culvert and catch basin thawing, operating steam hammers and pile driving, heating buildings and offices, and other uses.
- Heating and transferring asphalt, road oils, bituminous materials in tank cars and storage tanks.
- Thawing and heating aggregate in stock piles or bins for winter concreting.
- Heating water for central mixing plants, concrete block plants, or any large volume hot water needs.

Write for bulletins and complete information on the entire line of Cleaver-Brooks equipment for cold weather construction and maintenance.

Cleaver-Brooks

CLEAVER-BROOKS COMPANY
387 East Keefe Avenue
Milwaukee 12, Wisconsin

BUILDERS OF EQUIPMENT FOR THE GENERATION AND UTILIZATION OF HEAT.



IT TOOK LOTS OF CONVINCING to get these four construction stiffs together and motionless long enough to snap a picture during operations. Bert Sanders, general foreman; R. I. Senn, project engineer; Bill Denny, project manager; and Reinard Johnson, general carpenter superintendent.

(Continued from page 68)

with Northwest crane picking up laitence through the siphon as the pour proceeded, and numerous tugs and cabin boats to move barges, transport workmen, and keep regular river craft down to a speed low enough to prevent washing wave action.

Continuously, day and night, aggregates were clamshelled from barges and dumped into hoppers; materials were weight-batched (5 bags of cement per cu.yd.) and passed down into mixers; then poured into concrete buckets and hoisted up into a hopper; finally paid into the chute and out to the 87-ft. tremie pipes. Total seal pour depth of 32 ft. was obtained in four 8-ft. lifts with continual soundings taken to prevent mounding-up of concrete. Seven days later the cofferdam was dewatered and work continued in the dry.

Control of the record-breaking pour was entrusted to Bill Denny, project manager for Merritt-Chapman & Scott. Among his efficient helpers were R. I. Senn, project engineer; Bert Sanders, general foreman; and Reinard Johnson, general carpenter superintendent. Howard, Needles, Tammen and Bergendoff are engineers for the Delaware State Highway Department with O. H. Ammann and Moran, Proctor, Freeman and Mueser as consultants. Consulting architect is A. Gordon Lorimer.

FIRST PRIZE...One Mile of Blacktop

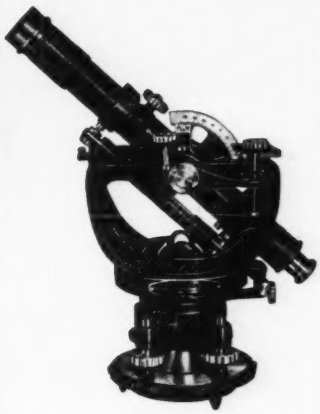
THE PROBLEM WAS to get a crowd to attend the dedication ceremonies of the new $150,000 county highway garage at Madison County, Indiana. The solution was easy. The county commissioners offered a mile of blacktop road to the township which had the largest representation.

Almost five thousand of the county's 7,000 residents appeared, inspected equipment and building, and listened to an interesting talk by Professor Ben Petty from Purdue University.

The winning mile of blacktop was awarded to Adams township with a roll call of 185, and will be laid down next spring in whatever part of the township they choose.

Avoid COSTLY ERRORS

Save Time and Money



You'll find

THE DAVID WHITE UNIVERSAL LEVEL-TRANSIT

is the Most Practical All-Around Contractor's Instrument you've ever Handled

YOU'LL be time and money ahead if you use a David White Universal Level-Transit in all your survey and checking operations — building and road construction. It is a low-cost, accurate, rugged instrument. Quickly converts from level to transit. Designed to provide maximum strength and protection — assuring you constant precision.

Among its many features are: Full 12" telescope with 25 power coated optics, a patented ball-bearing race, lock and release lever system, easy perfect alignment adjustments, guarded horizontal circle, vernier accurate to 5' vertical arc 3" diameter. Write today for complete information and the name of our nearest dealer.

We offer complete, prompt, repair service on all makes of instruments — levels, transits, theodolites, etc.

DAVID WHITE COMPANY

Manufacturers of Instruments for Engineers, Surveyors and Builders

343 West Court Street
Milwaukee 12, Wis.

Long cantilever reaches out toward balanced panels for . . .

Closing the Gaps in Memphis Bridge

BIG CANTILEVER BRIDGES call for big equipment, bold but safe methods of cantilevering, and flexible erection procedures.

All these measures were cleverly coordinated by the Harris Structural Steel Co. in erecting five cantilever truss spans (2,823 ft.) of the new highway bridge over the Mississippi River at Memphis, Tenn. Span lengths are 431-621-621-790-359 ft.

Only two erection bents were needed to span the river channel. Yet the steel went up at a fast clip, due to the versatility of erection derricks and coordinated erection procedures. Three identical derricks, fabricated by Harris especially for the job, erected the five cantilever spans.

For ease in following the sequence of derrick moves, and other erection procedures, the derricks are designated A, B and C, on the accompanying drawing. Erection schedules called for each derrick to be set up and dismantled twice—making six derrick assemblies in all.

Spans 1 and 5 were erected on conventional falsework over dry ground. Each served as an anchor span for cantilever erection in Spans 2 and 4. Span 4 was cantilevered eleven panels (402 ft.) beyond Pier 4 to closure with the remaining six panels in that span. These six panels are part of ten panels of trusses erected by balancing over Pier 3 and one of the erection bents.

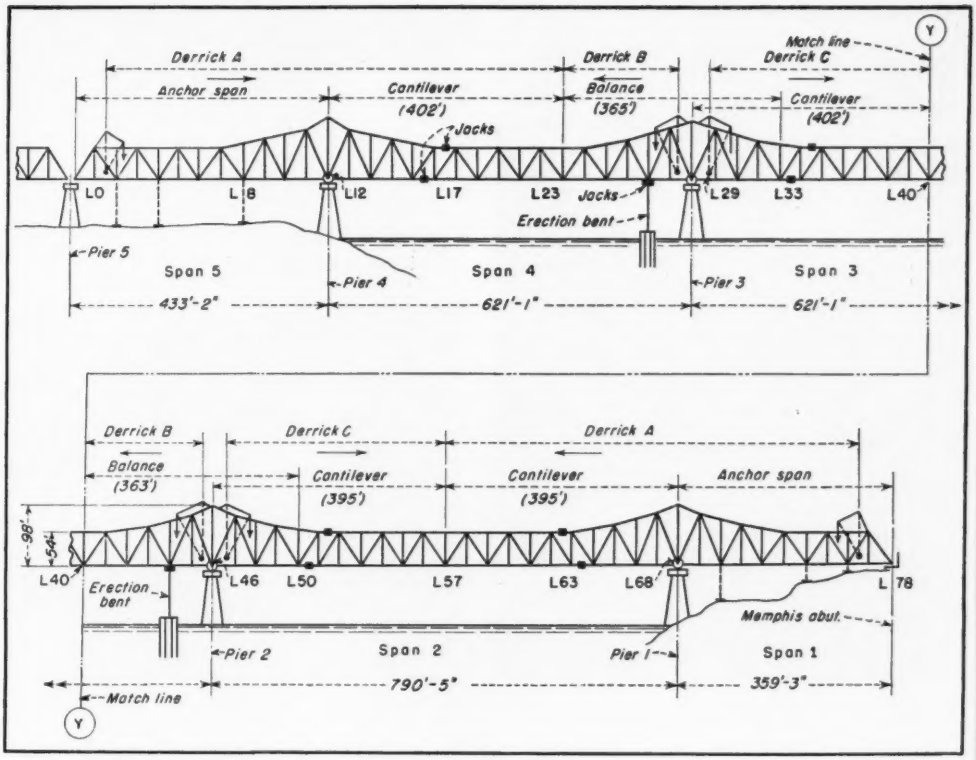
Span 3, identical with Span 4, was erected in the same manner. Span 2 was cantilevered eleven panels (395 ft.) each way from its supporting piers.

All three traveling derricks operated on the floor steel, with backstays to top chords of the trusses. Each had a 120-ft. mast, 110-ft. boom and a 40-ton lifting capacity.

Derrick A was set up at L2 in Span 5 following erection of a temporary bent on dry ground at that point, and placing of the first two panels of floor steel by a 60-ton crawler crane. The derrick advanced eastward (toward Memphis) erecting Span 5 by conventional cantilever methods, with erection bents placed successively at L4 and L8.

Derrick A continued on past Pier 4, erecting to L23—the limit for cantilevering according to the design erection stresses. In the meantime a derrickboat with 116-ft. boom had completed the erection bent at L27 and 2 panels of floor steel over to Pier 3.

Derrick B was set up on this floor



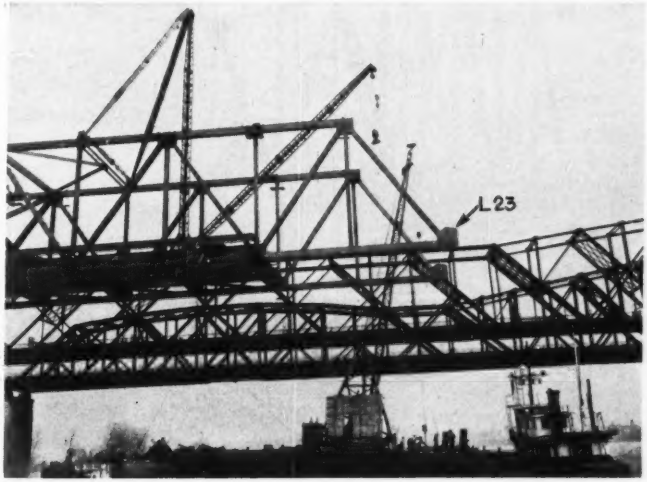
ONLY TWO ERECTION BENTS are needed for three river spans on Memphis Bridge after erection of end spans by conventional falsework on dry ground. Three closures—at L23, L40 and L57—are made by 500-ton hydraulic jacks operating in members carrying zero stress in completed bridge. Fast-moving erection schedules call for each of three traveler derricks to be set up and dismantled twice.

steel and guyed to Pier 2, to the erection bent, and to short outriggers over Pier 3. In this position, it operated as a guy derrick and erected truss steel, by the balancing method, on both sides of the bent. Derrick C was set up at L31 and erected balanced steel to L33.

Derrick B erected steel back to closure at L23. While this was going on, Derrick A was dismantled and reassembled at the Memphis abutment (L78) for erection of Span 1. Three bents were needed for this span, the same as for Span 5. Derrick A continued west, erecting steel to L57—the midpoint of Span 2 and the point of final closure for the entire bridge.

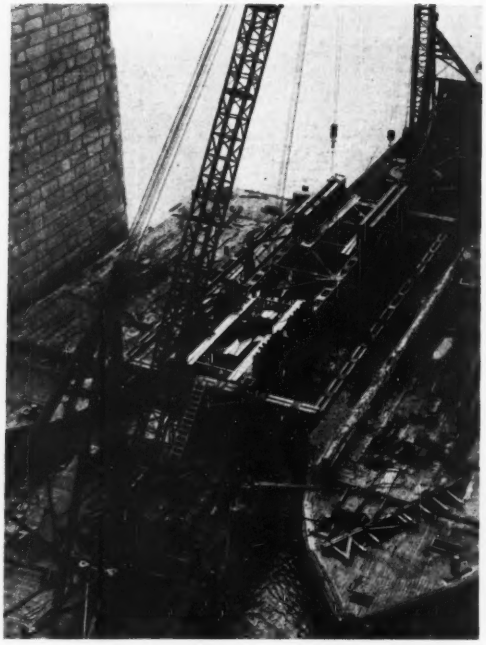
Derrick B was taken down after it had made the closure in Span 4. It was moved ahead to Pier 2 and set up on two panels of floor steel between the pier and the second erection bent, to erect balanced steel at that point.

In the meantime Derrick C

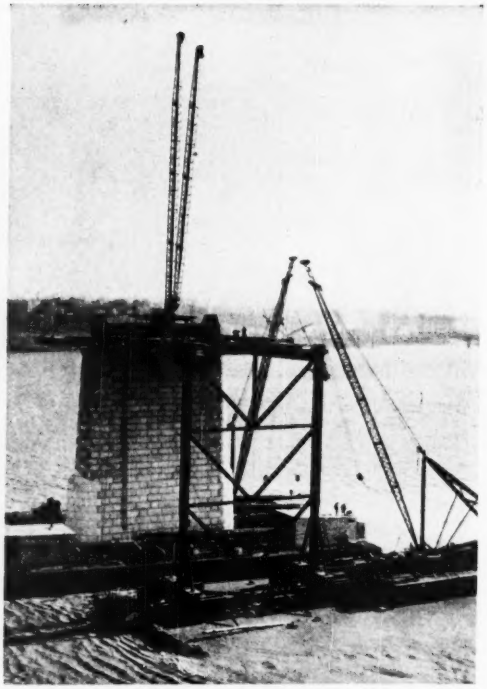


TEAMWORK between overhead traveler and floating derrick places 16-ton lower chord in final panel of Span 4 cantilevered section 60 ft. above river. Traveler stiffiegs are tied back to top chords. In background are Frisco R.R. and Harahan highway bridges.

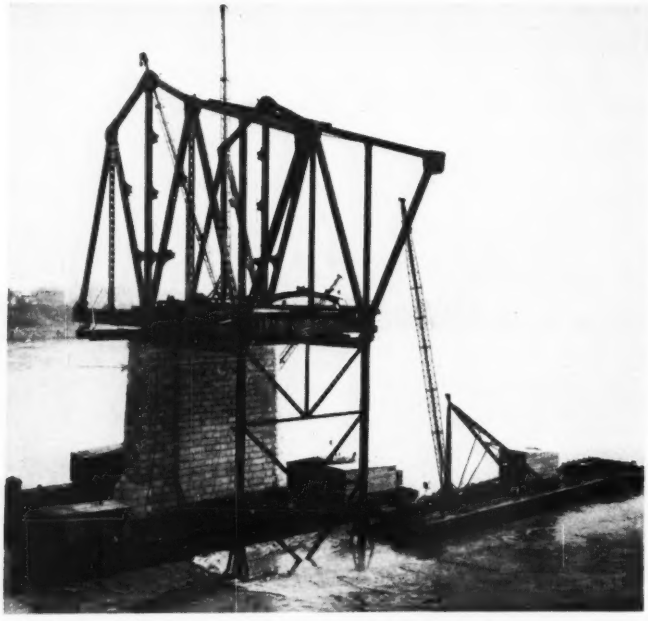
Balanced Erection at Pier 3 . . .



1 BRACED AND SPUDDED steel cage forms template for driving 32-H piles supporting grillage base of falsework bent.



2 FALSEWORK BENT is erected by pair of floating derricks which also set guy derrick in place on pier.



3 PROPPED UP by single falsework bent, truss and floor steel are balanced over Pier 3, eventually totaling ten panels in length to meet cantilevered sections coming out from adjacent piers.

erected steel east to L40; corresponding to L23 of Span 4. While Derrick B was erecting, by balancing, back to L40 and making the closure at that point, Derrick C was reset at Pier 2 to carry balanced erection to L50. After Span 3 was closed, Derrick C continued erecting steel to final closure at L57.

While the foregoing sounds complicated, it was comparatively simple, according to Harris' resident engineer Ed. Guerber and erection superintendent Bob Smith. A great deal of planning, however, went on behind the scenes. Erection designs and procedures were worked out under the direction of Frank A. Swertz, chief engineer.

Both erection bents at Piers 2 and 3 set on a steel-beam grillage supported by 32 H-piles driven into the riverbed. They were driven through a braced and spudded steel cage for stability against river currents, wind and drift.

Two derrickboats, each mounting a 30-ton, 116-ft. boom stiffleg derrick take care of operations in the river. They drove the falsework piling, erected the bent at

(Continued on page 80)

WE THINK *it's a good sign*

Unofficial figures* indicate that on the evening of December 24, 1949, hardly anybody will be thinking about the low price of cement. Of 100 persons interviewed on that date last year, more than 99.9% said their minds were occupied with reindeer, chimneys, bulging stockings, mysterious packages, mistletoe and glittering trees.

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**Not from U. S. Bureau of Labor Statistics*

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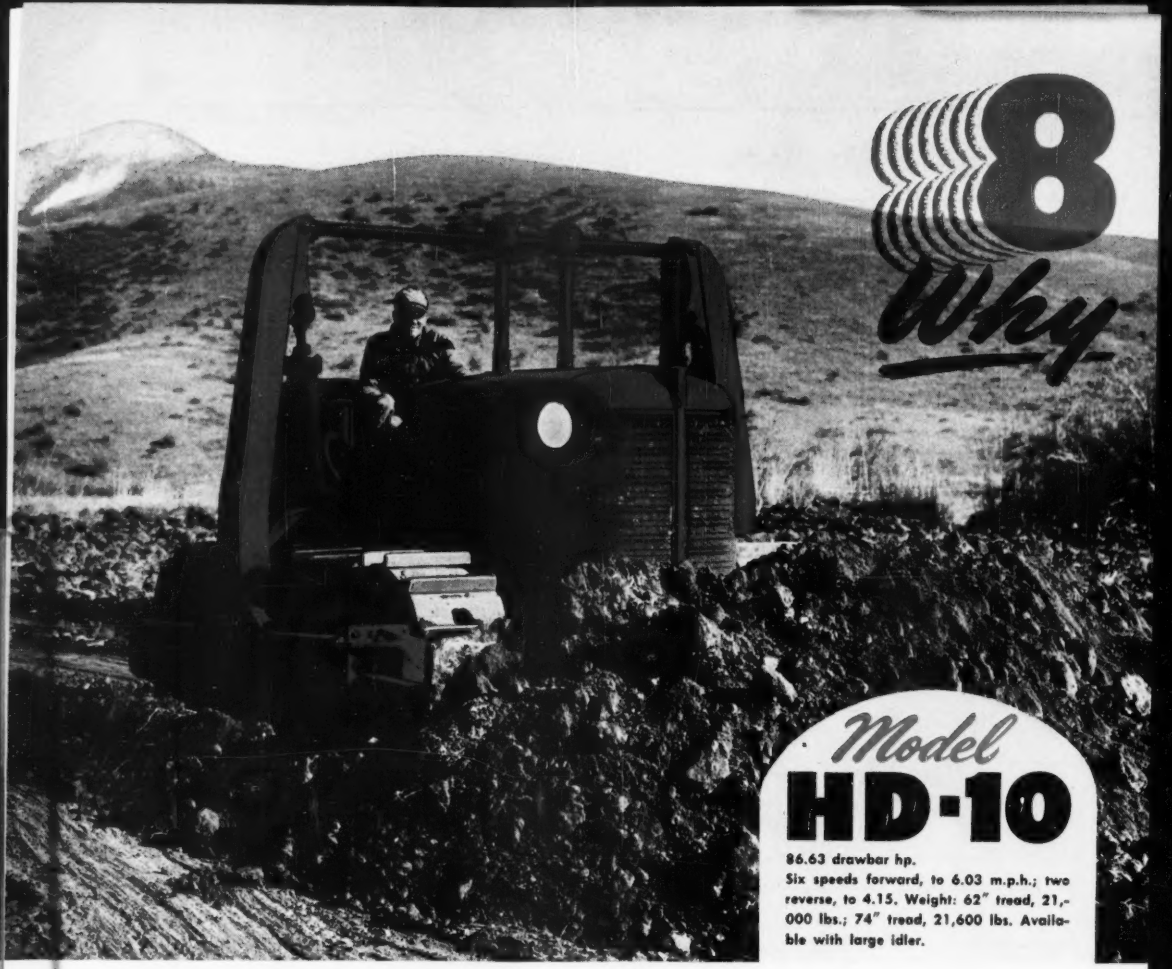
8 Why
Model
HD-10
86.63 drawbar hp.
Six speeds forward, to 6.03 m.p.h.; two reverse, to 4.15. Weight: 62" tread, 21,000 lbs.; 74" tread, 21,600 lbs. Available with large idler.

Let the Outstanding Advantages of These AHEAD-OF-THE-TIME Tractors Boost Your Production and Cut Your Costs...as They Have for Thousands of Owners

1 **1,000-HOUR LUBRICATION** of truck wheels, support rollers and idlers. You operate six months on a 40-hour week basis with just *one lubrication* . . . instead of daily, or even weekly, attention. Think what this means in labor and lubricant sayings . . . and in working time gained! Think of the safety factor, too—no costly damage by greasing neglect.

2 **GENERAL MOTORS 2-CYCLE DIESEL ENGINE** Rugged, simple, economical, "hanging-on" power. Smooth — every down stroke a power stroke . . . less wear and tear on tractor and operator. Far less power loss than other engines at high altitudes.

3 **INTERCHANGEABLE ENGINE PARTS** Nearly all of the GM engine wearing parts are interchangeable with each of the GM engines on the various models of A-C tractors and motor graders—no matter the size. Lowers parts investment, simplifies maintenance for Allis-Chalmers fleet owners.

4 **INSTANT STARTING** GM 2-cycle diesel engines start as easily as your automobile . . . and they *start* and *operate* on *diesel fuel.* No need to let 'em idle during work-stop periods — no unnecessary engine wear or fuel waste.

Ask any owner...or arrange for a demonstration with your Allis-Chalmers dealer ..."SEEING IS BELIEVING"

Big Reasons

they're so popular

Model

HD-7

60.10 drawbar hp.
Four speeds forward, to 5.00 m.p.h.; reverse to 1.89. Weight: 52" tread, 13,830 lbs.; 63" tread, 14,000 lbs. Available with large idler.

5 **FAST MANEUVERING** 2-cycle diesel tractors are well known for their fast-working ability — not only for quickly traveling from cut to fill, but for turning around instantly in their tracks . . . and for easy maneuvering in and around tight places — especially important on bulldozing. Time saved is money made!

6 **PROPER BALANCE** Weight, speed and power are positively balanced in A-C tractors, assuring top performance on every job — pulling, pushing, lifting.

7 **OPERATOR COMFORT** All these advantages mean operator satisfaction, too — resulting in more work done more easily. Besides — he has a big, wide, comfortable seat, cushioned back, arm rests, roomy platform, convenient controls, good vision.

8 **MATCHED ALLIED EQUIPMENT** Each Allied manufacturer, skilled in his own field, works in complete cooperation with Allis-Chalmers in designing and building auxiliary equipment.

ALLIS-CHALMERS

TRACTOR DIVISION • MILWAUKEE 1, U. S. A.

Originator of the Torque Converter Tractor

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TRACKS, FLOORS

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No. 790 GREENLEE PUSHER For 3/4 to 4-inch pipe. Six Speeds—6,500 to 40,000 lbs. pushing pressure.

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POWER PUMP for both sizes of GREENLEE Pushers. Pushes pipe at rate of two feet per minute.

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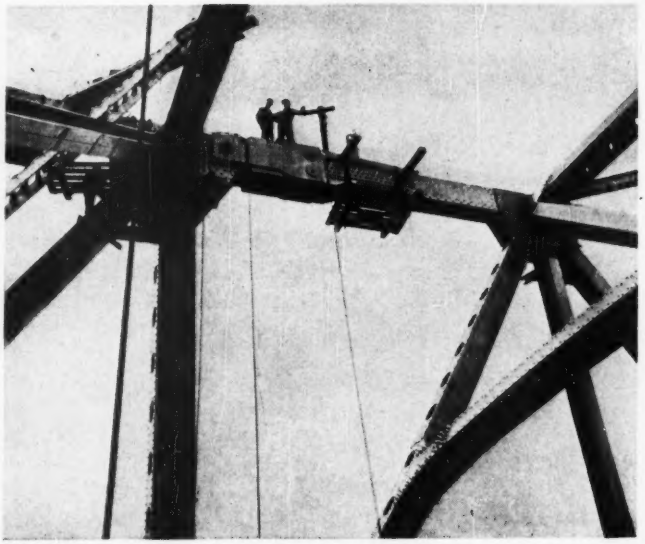
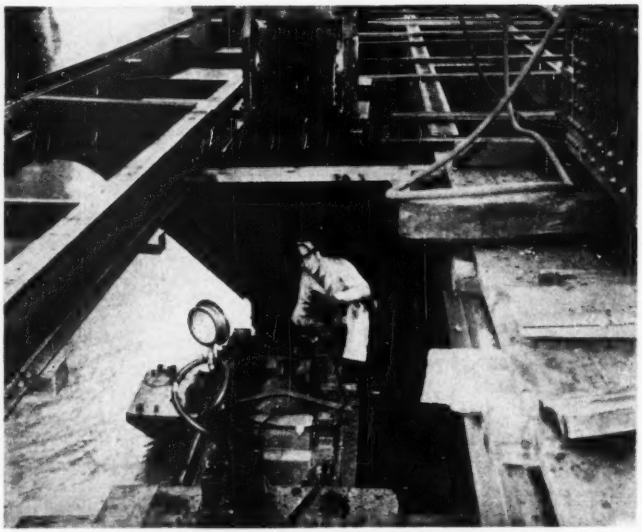




NERVE-CENTERS of operations during closure of Span 4 at panel point 23 are the 500-ton hydraulic jacks inclosed in top-chords U17-U18 (top) and in bottom-chords L16-L17 (bottom). Permanent members will replace these jacking assemblies in the completed trusses.

(Continued from page 76)

Pier 3, placed the two panels of floor steel at that point, and did the same at Pier 2. In addition, these derrickboats dismantled the three top derricks and reset them as necessary.

Hoisting and swinging power for the top derricks when erecting balanced steel over Piers 2 and 3 came from a hoist-barge anchored directly beneath the derricks. It had two special three-drum Clyde hoists, each with a 20,000-lb. line-pull.

The two derrickboats, each mounting a 7,000-lb. line-pull Clyde hoist, unloaded truss steel from barges and assisted the top derricks with erection. The two hoists on the barge and the one for Derrick A were built for this job.

STEEL GRID FLOORING—to be filled with concrete—is welded to roadway stringers with current supplied by battery of five Lincoln Electric arc-welding machines. Trough in flooring is for 3-ft. concrete raised median strip to be installed later.

AN AIR HOIST (foreground) follows out on the cantilever close behind the traveler to swing its 110-ft. boom, but boom and load lines run back to a hoist anchored on previously-erected span.

Sixteen 500-ton hydraulic jacks for making the truss closures also were built by Harris especially for the job. In making the first closure two jacks were placed in each top chord member U17-U18, and two in each bottom chord L16-L17. These eight jacks could move the ends of the cantilevered trusses at L23 both vertically and horizontally.

One jack was placed under each truss on top of the bent at L27 to raise or lower the west cantilever of the balanced steel at Pier 3, in making the closure at L23.

Closure of Span 3 was made in similar fashion, with the jacks in the same relative positions. For final bridge closure at L57, two jacks were placed in each top chord U51-U52 and U63-U64, and in bot-

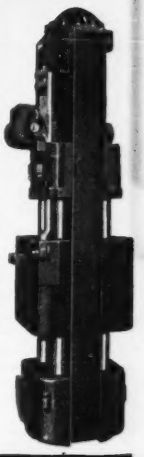
(Continued on page 82)

ENDURANCE
...built in

SUPER-VULCAN
OPEN TYPE
DIFFERENTIAL-ACTING
PILE HAMMERS
18C, 30C, 50C and 80C

● When the job is finished, the last pile battered down, your Super-Vulcan is ready to go again. Toughness, strength, dependability, endurance are built right into this powerful pile hammer. They combine with simple design and easy operation to cut maintenance costs to the bone and to boost the tested positive action of this machine to maximum efficiency.

The Super-Vulcan drives wood, concrete or pipe piles, steel sheeting or H beams. It fits the same leads and uses the same accessories as Warrington-Vulcan Single-Acting Pile Hammers.



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Wide-Range Line of
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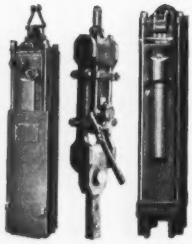
***and* EXTRACTORS**



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EXPERIENCE builds 'em
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MEN IN CHARGE OF JOB are (top) O. F. Sorgenfrei, resident engineer, Modjeski and Masters, consulting engineers; Edward L. Guerber, job engineer, Bob Smith, erection superintendent, and F. H. Horton, assistant superintendent of erection, Harris Structural Steel Co. At Bottom: R. P. Holly, assistant resident engineer; Tom Williams, clerk; Sorgenfrei; and bridge inspectors Tom Mancuso, E. H. Andrews, H. E. Eckhoff, and G. E. Stone—all with Modjeski and Masters.

(Continued from page 81)

tom chords L50-L51 and L63-L64.

In all instances the closure jacking assemblies were at the ends of suspended spans and at the points of articulation between successive cantilever arms and anchor arms in the multiple cantilever section which carried zero stress in the final trusses. These assemblies were replaced with permanent chord sections in the completed trusses.

Harris' contract also included the erection of the two 431-ft. simple through truss spans, Nos. 6 and 7. Both spans were erected by conventional cantilevering.

Harris brought in two 500-cfm. Ingersoll-Rand and two 350-cfm. Gardner-Denver compressors to supply plenty of air on the job. One of the I-R's, on top of the floor steel, delivered air at 130 psi. to a 500-gal. receiver which connects with 500 ft. of 4-in. line. There were 27 Christmas trees, or manifolds, in the line for 1-in. take-off lines to serve six riveting and bolting crews and to furnish swinging power for Derrick A.

No small amount of welding was needed for fastening the Carnegie-Illinois concrete-filled steel grid floor on the roadway and sidewalks. Power for this operation came from a battery of five Lincoln-Electric semi-portable welding machines, located on the grid floor.

Harris' $4,606,000 contract included furnishing and erecting 25,300,000 lb. of steel in the 2,823-ft. five-span cantilever and the two 431-ft. simple truss spans, from the Memphis abutment to Pier 7. It also included placing conventional reinforced concrete roadway and sidewalk slabs on Span 1 (needed for weight in this anchor arm) and the roadway deck and sidewalks on the other six spans.

Structural steel was fabricated in the Company's shops at New Market, N. J., shipped by rail to Pittsburgh, Pa., and by barge to Memphis.

The completed bridge will be just 60 ft. short of a mile in length. It will carry two 24-ft. roadways, separated by a 3-ft. raised median, with 6-ft. sidewalks on the outside of the trusses which are spaced 56 ft. 6 in. c. to c. Modjeski and Masters, consulting engineers, designed the bridge and furnish a field inspector on construction. O. F. Sorgenfrei is resident engineer, assisted by R. P. Holley.

GULF PRODUCTS *and* FINE SERVICE

keep equipment rolling

at Allatoona Dam

Coffee Construction Company, Fessman, Georgia, is constructing a saddle dike at the Allatoona Dam across the Etowah River near Cartersville, Georgia. The project calls for over 283,000 yards of excavation, over 222,000 yards of earth fill, and 6¼ acres of clearing and grubbing. This contractor is also building the approaches and concrete piers for the bridge on an access road in connection with the Allatoona Dam project.

ANOTHER big earth-moving project where Gulf quality products and cooperative services are working as a team to help the job roll smoothly and efficiently.

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SAFE CONSTRUCTION PROCEDURES

THIS IS THE THIRD and final part of a series on safety in construction taken from a safety manual compiled by the Construction Division of the Engineering Dept., E. I. du Pont de Nemours & Co., Inc., Wilmington, Del. for the guidance of contractors and subcontractors entering into work with Du Pont. With their kind permission, we published the first section in our October 1949 issue, covering rules for men and materials; then followed up in November with an article on safety standards. This final installment covers safety regulations for office and service groups, as well as Du Pont's procedure for insuring compliance by inserting a three-point clause in construction contracts.

3...Safety Regulations

Office and Service Groups

A DETAILED ANALYSIS of accident possibility indicates very clearly that office workers and service employees are exposed to many hazards and that to avoid personal injury they must exercise reasonable care and good judgment in the performance of their daily work—just as do the men in the field.

1. A desk or cabinet drawer left open is a very serious collision and tripping hazard. Keep them closed and don't pinch your fingers while closing them. Also keep packages out of walking areas.

2. Tilting a chair back in order to get in a more comfortable position is a widespread practice and a bad one. Many people have been injured due to chairs slipping out from under them or breaking due to the added strain that such a position places upon a chair. Don't do it.

3. The use of pins to fasten papers together has been the cause of many scratched and pricked fingers. Pins, therefore, are not to be used. All other fasteners should be handled carefully.

4. Fingers may be cut when handling any paper. Avoid this by being careful.

5. Any person who receives a cut, scratch, bruise, (including blood and water blisters) sprain, strain, or any other form of injury, no matter how slight and regardless of whether or not the skin may be broken, must report immediately to the First Aid Station for treatment. First Aid supplies must not be kept in the offices, nor non-professional treatment given.

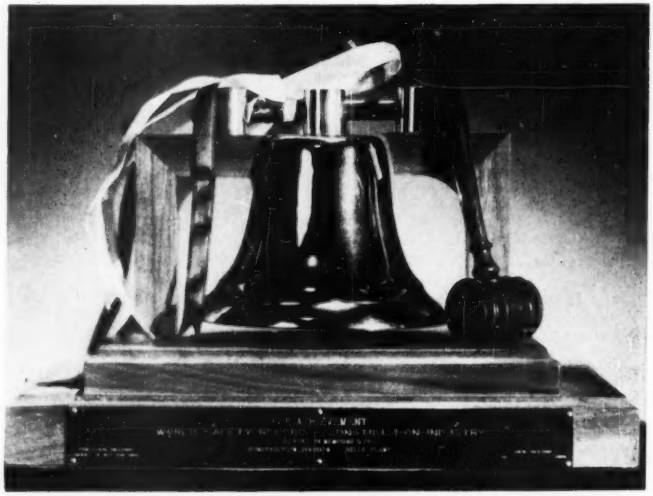
6. Pencils, pen points, scissors, etc., should be carried in such a manner that the sharp points cannot cause puncture wounds to their owners or others. Carry them point down in pocket, when not in use, and not between fingers with point in palm of hand.

7. Defective chairs and desks and any other equipment are hazardous and may result in injuries. Don't keep such equipment in service.

8. Cords on electrically operated office machines may cause people to trip and fall if left on the floor or across passageways. Inspect before short circuits, not after.

9. Many persons have received black eyes from walking into partly open doors. Keep them closed or opened all the way back against the wall in order to avoid this danger.

10. Good housekeeping is the keynote of Safety as well as efficient workmanship. Keep your desk clean and orderly.



INCENTIVES AND ACKNOWLEDGMENT are part of management's duties for work well done. This trophy represents world's safety record of 4,420,000 safe exposure hours, preceded by a great deal of prior safety effort, and was awarded to workmen on Belle plant at Belle, West Virginia.

SHOWN HERE addressing Sabine River Works' construction safety mass meetings is J. A. DeLuca, safety superintendent of Du Pont's Engineering Dept., who is largely responsible for the safety manual presented in this series.

11. No horseplay. Don't shoot paper clips and wads of paper with rubber bands, etc., or engage in any of the practices that may come within this term.

12. A standard four-drawer correspondence file can be very dangerous as it may upset when the top drawer is opened, if the top drawer happens to be heavily loaded and the lower drawers are empty or filled with lightweight materials.

13. Electric fans can inflict serious hand injuries. Keep them off desks and have them located high enough above the floor to be out of reach. Put screen finger guards near controller of desk types, if used.

14. If five-gallon glass bottles are needed for drinking water they should be covered with canvas or rubber to protect people who handle them from possible cuts in case of breakage. The standard wooden carrying box should be used.

15. Don't walk headlong or too hurriedly from rooms into corridors, especially dark ones. When walking in corridors, keep to the right, particularly at corners.

16. Don't drive nails in walls to hang file boards and other articles —use cup hooks or other suitable devices.

17. Keep storerooms and rest rooms clean and orderly.

18. Don't store combustible material closer than 6 in. to any steam pipe or radiator.

19. Don't heat stoppered bottles by placing them on radiators or steam pipes. They may get too hot and explode with serious results from flying glass.

20. Take time enough to be safe when using stairways. Never run on stairs, especially with high heels.

21. Don't place articles on window sills, filing cabinets, etc., which may cause injury if they fall.

22. Be careful to keep hands free when raising or lowering windows; also when closing doors and gates.

23. Knives and blades should never be placed in desk drawers with blade open. Don't use makeshift tools.

24. Beware of hernia, sprains, strains, and splinters from lifting or shifting equipment and supplies.

25. Never deposit oily cloths, glass, or blades in waste baskets.

26. When out of the plant observe the rule which specifies the left-hand side of the road for pedestrians. Look both ways before crossing roads or stepping on to road from behind a parked car or a blind corner. When you walk avoid ankle-spraining objects.

27. When operating a motor vehicle, drive with care and watch for pedestrains and railroad crossings. The trains have the right of way. Don't speed.

28. Familiarize yourself with all regulations in the "Manual of Safe Practice and Information for Employees" which may now or at some future time apply to you, depending on what you do or where you go.

29. Look out for broken bottles, porcelain faucet handles, slippery, soapy, waxy or icy floors or walkways, and tripping door mats.

30. If you have smoking privilege, be careful.

31. Keep an eye on sanitation.

Guards, Firemen, Service Employees

(Non-Mechanical)

1. The nature of this work (protection) makes it a logical one to assist in the enforcement of all rules when you can. You are authorized to caution with discretion anyone in the plant whom you know to be breaking any rule, whether it be strictly safety or deportment.

2. Although you may be called on for emergency service from time to time, do not expose yourself uselessly. For example: Falling off fire truck, accosting suspects, plant traffic and parking hazards, approach to or traffic through buildings in emergencies or at times of suspected trouble. Be careful to have enough light when making patrol rounds of the plant at night and during the icy, winter months.

3. Keep yourself adequately protected from the elements in all kinds of weather.

4. Keep safety conscious in all

(Continued on page 86)

DON'T FALL!

(Continued from page 85)

your task performances, large or small.

5. Discipline yourself to comply with the plant general safety regulations.

Information for Foreman

The following items are placed in your hands primarily as a check by yourself on the quality of your foremanship and not necessarily because you may never have heard of them before.

Foremanship in all industry must improve to keep pace with modern scientific material improvements.

Good foremanship develops from initiative and a sense of responsibility for results. Initiative is that quality in a foreman which causes him to investigate his every responsibility, large or small, in view of attaining better results.

Apply this thought to the attention to hazards in this present "safety-consciousness" drive, as well as to the scheduling of your mechanical work or of your efficiency in handling your men.

Much is said in modern industry about training by foremen. Many foremen in factories have the job of apprentice training, as well as job training. In our work here, job training is of more concern than apprentice training, but it is just as important as any factory job training from the standpoint of results desired.

There is much concerning safe practices and efficiency which you should be able to teach every man who works for you. Much teaching can be done by dropping the right word to the right man at the right time and by doing it often enough. If you are a foreman with an accident record, those accidents are some of your results. If you have few or no accidents, they, too, are your results.

Take the few seconds necessary to show the man you are teaching the principles involved, and you will have less teaching to do. In a discussion of "How long is a new employee to be trained?" the parallel can be made to our school system—"How long do we train students?" The answer is obvious, when we consider that after every group of class grades there is another commencement, and so it goes on and on, never ending.

A good foreman is a LEARNER as well as a TEACHER—bend over and listen to the other fellow sometimes. The foreman is always the spearhead of the safety instruction attack. The Safety Engineer may give the new man the plant rules, the departmental rules, but the job rules are a teaching requirement and responsibility of the foreman always.

Job training and safety training are to go hand in hand if there is to be real efficiency from any foreman. Think this through to the cost of accidents under your supervision and what it could amount to.

In the question of discipline for your men or for yourselves, consider that there is a great deal of difference between being FAIR and LIBERAL. To be fair should be the goal of every supervisor and foreman; to be liberal is merely spending somebody else's money. Think this over, which are you actually, FAIR OR LIBERAL?

A good foreman is and must be a good salesman, because he is required to sell his ideas to the men under him, as well as to the men above him. A good foreman needs to:

1. Attract favorable ATTENTION for his ideas, his orders and his instructions.

Cut LARGE PIPE Safely

ELIMINATE SLEDGE AND CHISEL ACCIDENTS
MAKE CUTS SAFELY IN THE PRESENCE OF EXPLOSIVE MIXTURES
CUTS 12" TO 48" CAST IRON AND STEEL PIPE

The Wachs National Pipe Saw is actually a portable air powered milling cutter that travels around the pipe at a rate of 2" per minute, making a milled cut in one complete revolution. It not only does a neater, faster labor saving job, but also incorporates factors of safety not possible in other methods of pipe cutting.

Powered by air and using a milling cutter, the Wachs saw reduces the hazard factors to a minimum. Absence of open flame and sparks in the presence of explosive mixtures and slips and flying chips in the sledge and chisel method make Wachs Saw Cuts the safest.

TIME AND COST CUTTING FEATURES

- Minimum Pipe Line down time.
- Cuts under water in flooded ditches.
- No broken pipe, milled cut.
- Thor Air-Powered, no flames near pipe.
- Set-up time about 15 minutes.
- Portable—weighs only 265 lbs. Two men can carry and set up unit.
- Small excavation—only 14" clearance needed in ditch.
- One machine cuts all pipe sizes from 12" to 48".
- Only two adjustments necessary for size changes.

Write today for descriptive folder and engineering data on this new labor saving saw.

WACHS NATIONAL PIPE SAW

THE E. H. WACHS COMPANY

Manufacturers of Engines, Valves and Machinery since 1883

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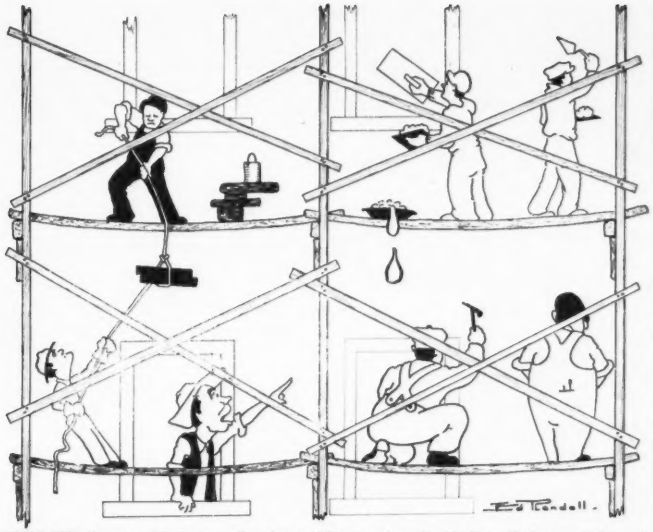

SPIKE SEZ: Doggone it! Are ye all trying to kill yourselves dead? Get off that scaffold and let's tear it down and begin all over again like you should have done in the first place. You know bum scaffolds are accident breeders. Use heavier posts, better planking and bracing, and put in some toe boards and hand rails. Get going while ye are still alive.

2. He must maintain INTEREST and favorable atmosphere about his job.

3. He must get APPRECIATION for the value of the work he and his men are doing.

4. He must acquire a genuine DESIRE for cooperation.

5. He must get the men's DECISION to follow instructions faithfully.

6. He must seek SATISFACTION for his men and from his men.

7. He must earn and maintain the CONFIDENCE of his men.

The safety promotion part of your foremanship should be dominated by a certain amount of discreet showmanship. Always remember that when a man is properly instructed, whether it be for Safety or job performance, his fear of you or of the task vanishes when enough knowledge concerning the job or the situation has been given to him. In other words, fear goes out when knowledge comes in.

Always have your men understand the spirit, as well as the intent, of the safety orders and you are bound to get better results. This can be done by voice tone, language, and the expressions. Your sincerity counts most.

Be a modern, informed group leader.

Control for Safety on Sub-Contracted Construction Work

Step 1—The prime contractor (Du Pont Engineering Department) provides a 3-point clause in all construction contracts. This is first presented to the contractor at the time of invitation to bid. The three points for safety in the contract clause are, and they strictly mean:

(a) The subcontractor will provide all necessary safety equipment, safe working conditions, and personal protective equipment for the nature of the work his employees will be required to do under the contract.

(b) The subcontractor will provide a minimum of 15 min. per week for safety education purposes for his employees (organized safety meetings).

(c) The subcontractor will provide a qualified person full time or part time as needed at the site of the work to see to the fulfillment of (a) and (b) above.

Step 2—The foregoing booklet of comprehensive, practical, and easy to use accident prevention specifications is issued to the subcontractor covering all construction

(Continued on page 88)

FlameZel TARPAULINS

PREVENT COSTLY FIRES

Immediate Delivery from These Distributors

NEW ENGLAND
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Drennan Steel Products Corp., Syracuse
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Montana Powder & Equipment Co., Helena
Western Builders Supply, Billings
WASHINGTON
Construction Equipment Co., Spokane

COST VERY LITTLE MORE THAN ORDINARY TARPS

FlameZel
Flameproofed by WenZel
TARPAULINS

Manufactured by
H. WENZEL TENT & DUCK CO.
ST. LOUIS 4, MO.

Which would you rather lose—property dollars or income dollars?

If disaster shuts down your operations, you will suffer an income and a property loss. You need protection against *both!*

Property insurance alone won't protect you against loss of income, but Hartford's Business Interruption Insurance can do just that. If fire, storm, or other hazards insured against, force you to suspend operations, Business Interruption Insurance can protect you against loss of anticipated earnings.

Business Interruption Insurance can give you *just what your business itself* would have given you if no interruption had occurred.

Here, briefly, is how Business Interruption Insurance protects you:

OPERATING STATEMENT FOR ONE MONTH

Before Fire

Sales	$30,000
Cost of Merchandise	18,000
Gross Profits	$12,000
Expenses	10,000
Net Profit	$ 2,000

After Fire—*WITHOUT Business Interruption Insurance*

Sales	None
Cost of Merchandise	None
Gross Profit	None
Expenses continuing during shutdown	$ 7,000
Net Loss	$ 7,000
Add. Anticipated Profit Prevented	2,000
Total Loss	$ 9,000

After Fire—*WITH Business Interruption Insurance*

Sales	None
Cost of Merchandise	None
Gross Profit	None
Income from Business Interruption Insurance	$ 9,000
Expenses which continue	7,000
Net Profit	$ 2,000

(Same as was anticipated had no interruption occurred)

Hartford's Business Interruption Insurance is adaptable to almost any business enterprise; stores, factories, garages, theatres, hotels, etc.

The Hartfords have prepared work sheets to help determine how great a loss you might suffer and how much insurance you will need to safeguard your income. Write for them—there's no obligation!

HARTFORD

HARTFORD FIRE INSURANCE COMPANY
HARTFORD ACCIDENT AND INDEMNITY COMPANY
HARTFORD LIVE STOCK INSURANCE COMPANY
Hartford 15, Connecticut

Year in and year out you'll do well with the Hartford

(Continued from page 87)

crafts. Each subcontractor is required to make use of only such parts of the booklet as his particular type of work may require. This booklet is inclosed with mailings of the "Invitation to Bid" to the home office of the bidding firm. If and when a firm bids successfully, a second copy of the Safe Practice booklet is issued to the local site superintendent of the firm undertaking the work, with a copy to the management of the firm at their home office, accompanied by the attached letter which, although standard in form, is always written as an original. Copies are routed to the subcontractor's home-office management, subcontractor's local superintendent, the local prime contractor's inspector's office, and the prime contractor's home safety office. ALL BIDS MUST INCLUDE AN EXTRACTED FIGURE SHOWING THAT FIRM'S CURRENT WORKMAN'S COMPENSATION INSURANCE RATE.

Step 3—The subcontractor's superintendent, on arrival at the plant site to begin work, must pass through the safety office of the prime contractor where the previous actions above stated are reviewed with him, and he is then and there given to understand that the prime contractor "means business" in these matters. He is advised how the prime contractor will aid him, and he is also told where, when, and how he will have to be self-reliant. The chief inspector of the prime contractor is the liaison man between the sub-contractor's and the prime contractor's local safety departments.

Step 4—All subcontractors are permitted to use the prime contractor's cash sales services for personal protective equipment on each site.

All subcontractor's supervision and workmen are by education, information, persuasion, and salesmanship ultimately led to follow all safety policies of the prime contractor by the timely and discreet direction of practical example. More often than not and because of lack of "know-how", the subcontractor is, "after the fact", glad to have had this leadership. Voluntary letters from many of the subcontractors, agreeably surprised by insurance rate reductions, are the best proof of the justification for reasonable prior insistence and leadership in these matters.

The New "201" CRUSHING and SCREENING PLANT

The shovel-loading hopper is fitted with inclined grizzly, and mechanical feeder. All principal units, shaft and V-belt driven. Motor, the full-enclosed kind.

You'll Like Its—

HIGH OUTPUT. With its jaw and roll crushers, the "201" is capable of producing especially large amounts of ¾" and smaller product.

CHOICE OF FEED. The "201" may be had with either shovel-loading hopper, or swivel drive for separate feed conveyor.

READY PORTABILITY. The "201" is of a size and weight that can be transported over most highways without a special permit.

ENCLOSED BRAKES. Hydraulic brakes, mounted on the *outside* of the wheels, are dustproof and watertight.

TOP-NOTCH ENGINEERING. All bearings of anti-friction type; all principal units, shaft and V-belt driven; all moving parts well protected by guards.

The roll-length platform provides a clear view of the screen. The clutches can be operated from the platform, or from the ground.

When fitted with shovel-loading hopper, the "201" plant is completely portable. Its parts need be removed for transporting.

AUSTIN-WESTERN COMPANY, AURORA, ILLINOIS, U. S. A.

BUILDERS OF ROAD MACHINERY

Austin Western

SINCE 1859

STEP UP YOUR MIXER OUTPUT . . .

with

KWIK-MIX

11-S Dandie, illustrated, is a 2-wheel, end-discharge non-tilter . . . also available as a 4-wheel mixer with side or end discharge. Note tilted Flow-Line chute for faster discharge of each batch.

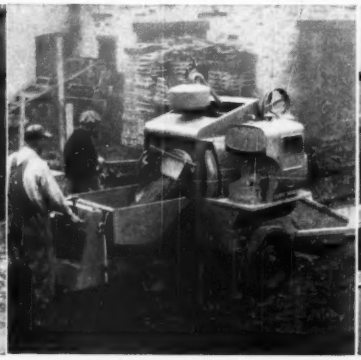
ON EVERY type of mixing job — concrete, bituminous or plaster-mortar — you can get bigger production, more profit for your labor and materials costs with Kwik-Mix mixers. Here are a few reasons why:

Through the double-mixing action of Kwik-Mix Dandie, you get perfect texture concrete at no increase in batching time or cost. Exclusive Flow-Line discharge chute reaches deep into drum . . . discharges each batch fast. Four Dandie sizes range from 3½ to 16 cu. ft. capacities, with wide choice of side or end discharge types.

For biggest production per man-hour on your bituminous work, it will pay you to check the 10 and 14 cu. ft. Kwik-Mix bituminous models . . . easy loading . . . accurate, thorough mixing . . . fast discharging. For your plaster work, there are 6 and 10 cu. ft. Plaster-Mortar mixers that easily keep ahead of the fastest men on any job.

Every model in the big Kwik-Mix line has silent, smooth-running "V"-belt drive . . . easily adjustable, accessible . . . delivers steady, trouble-free production. Whatever your mixer requirements, you'll find Kwik-Mix the lowest cost answer. Call your local Kwik-Mix distributor for complete facts . . . or write TODAY.

3-1/2-S Dandie; side or end discharge; tilting or non-tilting. Sturdy . . . light weight . . . portable.



6-S Dandie; end discharge; non-tilting. Also shown is 4 h. p. Moto-Bug — a versatile power wheelbarrow.

BITUMINOUS mixers; 10 and 14 cu. ft.; non-tilting; 4-wheel; also ideal as high production stationary plant. 10 cu. ft. model shown.

Send to: KWIK-MIX CO., Dept. CE, Port Washington, Wis.

Please mail bulletins on: Dandie* Mixers ☐ 3½-S ☐ 6-S ☐ 11-S ☐ 16-S

Bituminous Mixers ☐ No. 10 ☐ No. 14 Plaster-Mortar Mixers ☐ 6-P ☐ 10-P

NAME ..... TITLE .....

COMPANY .....

STREET .....

CITY ..... STATE .....

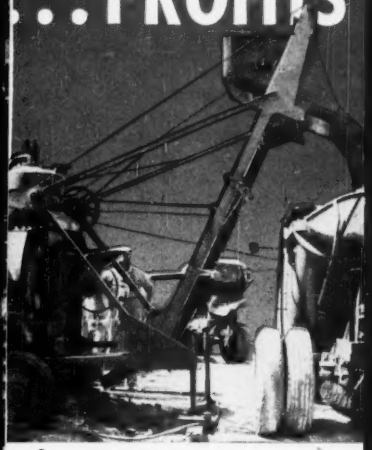
☐ Also send facts on new 4 h. p., 10 cu. ft. Moto Bug power wheelbarrow.

KWIK

Port Washington, Wis.

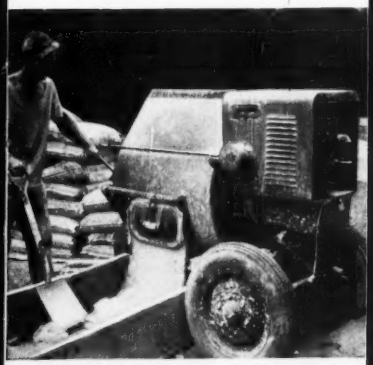
(Koehring Subsidiary)

. . . PROFITS



NEW TOWER LOADER for Kwik-Mix 11-S and 16-S

Now you can discharge concrete batches to forms above ground level, or direct into trucks with handy Kwik-Mix Tower Loader attachment. Fits 11-S and 16-S Dandie mixers . . . discharges at 9'2" height. Big bucket holds full batch . . . is raised by power . . . dumps automatically when it reaches top of tower. Mixer engine supplies the power. Single-lever operated from mixer platform. Saves you the time and cost of overhead mixer installations on many jobs.



PLASTER-MORTAR mixers; 6 cu. ft.; non-tilt; 7-second discharge; efficiently serves 1 to 30 plasterers. 10 cu. ft. size also available.

-MIX
COMPANY

KOEHRING PRODUCT

18.5 m.p.h. utility-size TRENCHMOBILE*

Rubber-tired, one-man Trenchmobile makes quick work of small trenching jobs, off-street connections, etc. Travels fast at road speeds to 18.5 m.p.h. over city streets and highways. No waiting for trailers. Works fast . . . digs up to 13.22 ft. per min., 4 ft. deep, 5" and 7½" wide. See your Parsons distributor or write direct to us for fact packed Trenchmobile bulletin.

PARSONS COMPANY
Newton, Iowa
(Koehring Subsidiary)

Big-Storage LO-BIN TROLLEY BATCHER

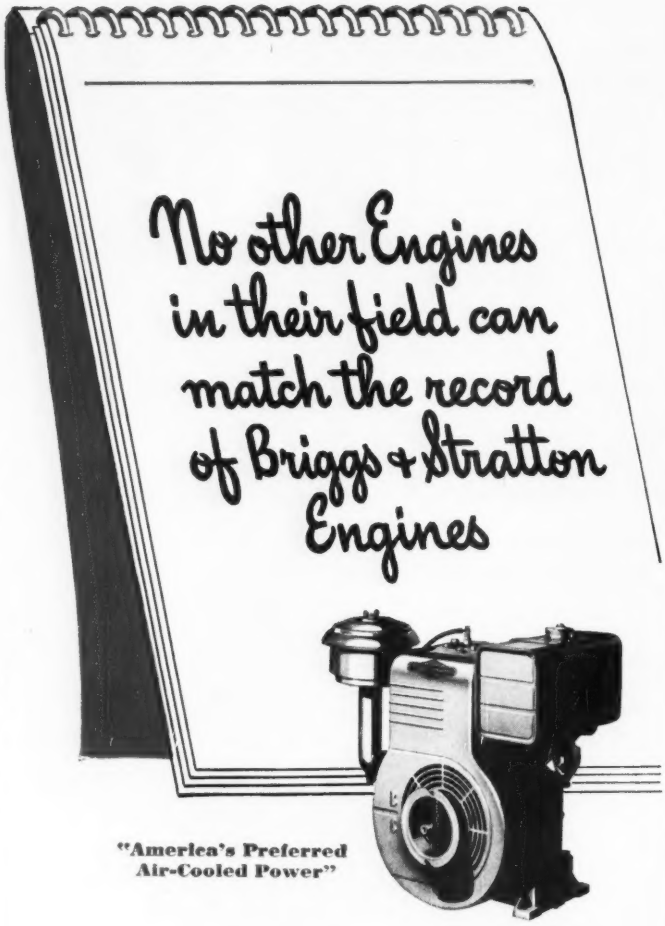
For big storage capacity and exceptionally low charging height. Available in 8, 20 or 30 ton capacities, in 7½', 8'8" and 9½' heights respectively. Furnished with 2, 3 or 4 compartments and up to 4 weigh beams. 22 cu. ft. weigh hopper is cantilevered, dumps directly into mixer skip. Efficiently serves 6-S, 11-S and 16-S Mixers. Optional mounting: wheels, pneumatic tires, tow-bar.

C. S. JOHNSON COMPANY
Champaign, Illinois
(Koehring Subsidiary)

Koehring 205 handles 7-3/4 to 10-ton lifts

As a lift crane, Koehring heavy-duty 205 safely handles 7¾ to 10-ton loads, depending on type of mounting. Available on crawlers or rubber-tires. Its fast line speeds also give you big production on clamshell or dragline work. Readily converts to ½-yard shovel or hoe. See your local Koehring distributor . . . or get complete story in big 28-page catalog . . . write TODAY.

KOEHRING COMPANY
Milwaukee 10, Wis.



There are more Briggs & Stratton air-cooled gasoline engines in service — on farm equipment, industrial machines, tools, and appliances — than all other makes of gasoline engines in their field combined.

Briggs & Stratton is the world's largest builder of single-cylinder, 4-cycle air-cooled engines — with unmatched engineering and manufacturing experience gained in more than 30 consecutive years of continuous production and the building of more than 4 million air-cooled engines.

You can depend on Briggs & Stratton engines — "America's preferred air-cooled power".

BRIGGS & STRATTON CORP., Milwaukee 1, Wis., U.S.A.

4 CYCLE BRIGGS & STRATTON GASOLINE ENGINES — World Wide FACTORY SUPERVISED SERVICE — Preferred Power FOR INDUSTRIAL CONSTRUCTION RAILROAD AND FARM EQUIPMENT

Hungry Horse Dam

(Continued from page 55)

so a closed water cooling system can be used in cold weather and an open system in summer.

In the year of preliminary work General-Shea-Morrison built a system of access roads, especially on the south slope to reach the cableway head-tower sites, developed a job water supply system, installed some $300,000 worth of their own electrical equipment, excavated 1,300,000 cu.yd., built the cofferdams and installed the cableways, aggregate plant and mixing plant. Stripping the canyon walls was quite a job in itself. Here they used Chicago Pneumatic wagon drills and hand drills, with equipment and men alike tied to safety lines. Part of the stripping was done with high-pressure water jets. Excavation of the foundation was by Northwest shovels and Euclid trucks.

For the U. S. Bureau of Reclamation, Clyde H. Spencer is construction engineer in charge of the project, David S. Culver is assistant construction engineer, Chas. F. Palmetier is office engineer, E. J. Niemen is field engineer and John D. Officer is assistant field engineer.

C. W. (Smoky) Wood as project manager heads up the General-Shea-Morrison staff on the job. He is assisted by R. W. Jones, chief engineer; Dave Henderson, office manager; Mel Hord, assistant to project manager; T. R. Harris, dam superintendent; Tom Moyer, assistant general superintendent; Les Gardner, Executive superintendent; Kenneth (Jack) Johnson, rigging boss; Rudy Salquist, concrete superintendent and O. W. Luther, electrical superintendent.

Contractors making up the combination include: General Construction Co., Portland, Ore.; Shea Co., San Francisco; Morison-Knudsen Co., Inc., Boise, Idaho; F. & S. Construction Co., Butte; J. L. McLaughlin, Great Falls; Pacific Bridge Co., San Francisco; Walsh Construction Co., New York; J. Birch & Sons Construction Co., Great Falls; Peter Kiewit Sons Co., Omaha; Kaiser Co., San Francisco; J. C. Boespflug Construction Co., Seattle, and Gilpin Construction Co., Portland.

COMING SOON—Details of Hungry Horse concrete mixing and placing, and aggregate production.

OPERATION WINTER

This winter, keep traffic moving with TRAXCAVATORS. Their smooth action and handling ease is a real time-saving combination when there's snow, slush or ice to be removed. TRAXCAVATORS plow the snow to one side, scoop it up, load it into trucks or carry it to a disposal point.

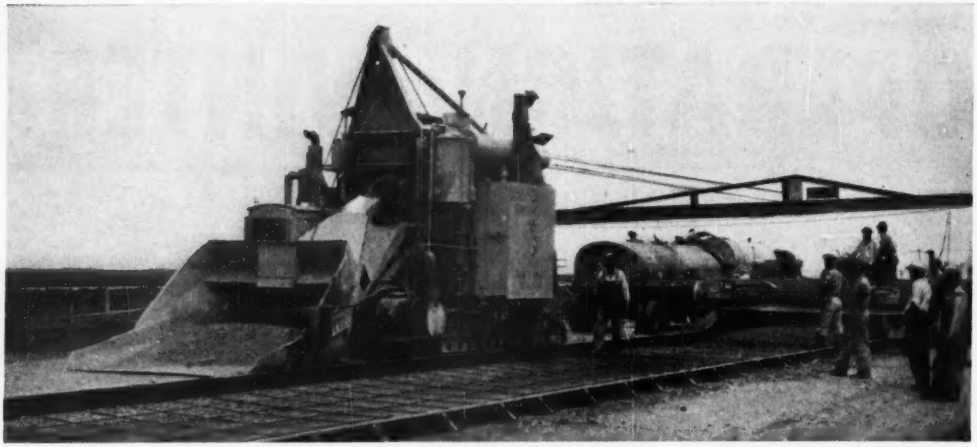
But snow removal is only *one* of the many jobs TRAXCAVATORS do. They are also kept busy on sanitary land fill, building and maintaining roads and streets, handling bulk materials and doing many other jobs of digging, loading or grading.

See your TRACKSON-Caterpillar dealer for full information, or write direct to TRACKSON COMPANY, Dept. CM-129, Milwaukee 1, Wisconsin.

TRAXCAVATOR

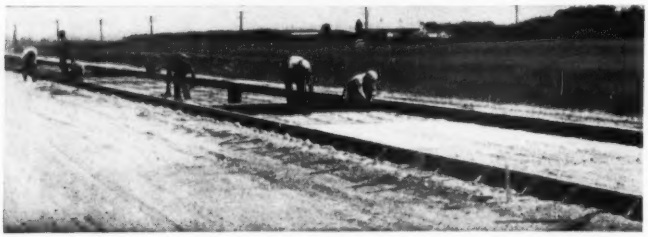
REG. U. S. PAT. OFF.

The Original Tractor Excavator



CANADIAN CONTRACTORS lay 3,240 ft. of 12-ft. pavement per day near Winnipeg with Multifoote 34E Duomix paver.

PACKAGED PLANT PAVES



FOLLOWING U.S. PAVING PROCEDURE, form stakes are driven by compressed air (top) ahead of subgrader (center) followed by placing of reinforcing steel and expansion joint filler (bottom).

WHEN THE BRABANT BROTHERS, Rosario and Dollard, highway contractors of St. Boniface, Manitoba, Can., decided to bid on a 14-mi. highway paving job south of Winnipeg, their first move was a flying trip to Chicago to gain first-hand information on mass-production methods employed by some big Illinois operators in paving.

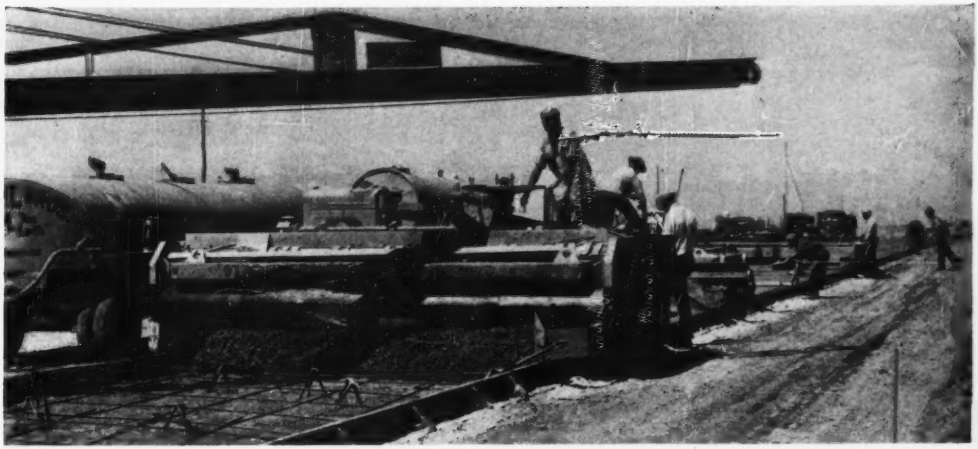
They were so convinced by what they saw—plus some good U. S. salesmanship—that they ordered through Kane-Marr Ltd., Winnipeg, a complete Blaw-Knox-Foote packaged plant for laying pavement, with the exception of aggregate trucks, 2 water tanks, 2 crawler cranes, a patrol grader, a Koehring longitudinal float, and two compressors.

Then they went back and bid on the job. They got the contract on their bid of $456,880, which was only 1 percent lower than their closest competitor.

The following first-hand account of the progress of the project was given a staff member of CONSTRUCTION METHODS AND EQUIPMENT by Paul F. Vollmer, of Blaw-Knox upon his return from a recent visit to the job, where he took the accompanying photos.

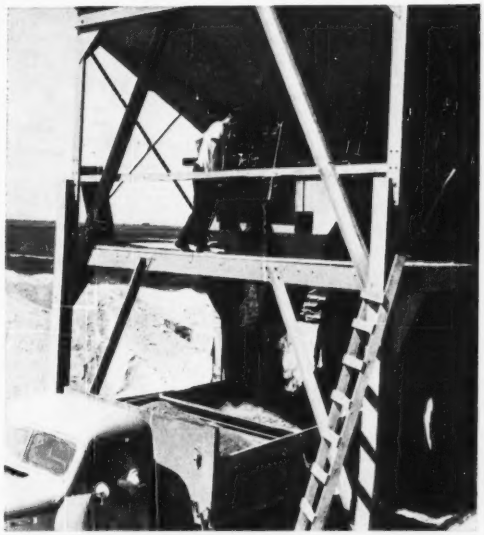
The contract was awarded last May 10. A nine-car shipment of Blaw-Knox-Foote integrated paving equipment (see accompanying table) arrived on the job June 10. Paving operations got under way two weeks later, following final preparation of the subgrade and

(Continued on page 98)



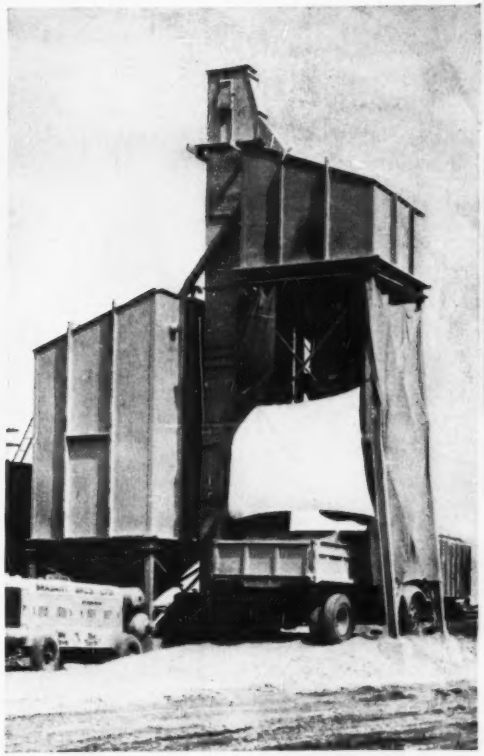
FULL-DEPTH PAVEMENT is placed in one pass of concrete spreader, following which, come finisher, hand-belting, and bullfloat. Steel chairs supporting the welded reinforcing mats are removed just ahead of concrete.

CANADIAN HIGHWAY



THREE-COMPARTMENT, 100-TON AGGREGATE BIN, charged by clamshell and crane, discharges into 2-batch trucks, after the cement has been added.

IN CHARGE OF JOB, are (l. to r.): Brabant Brothers, Dollard and Rosario; George Durnin, project engineer; and Hon. Erik Willis, minister of public works, for Province of Manitoba.



CEMENT BATCHING PLANT contains 200-bbl. bin charged by undertrack screw unloader and bucket elevator, and a 400-bbl. auxiliary bin fed by overflow pipe from smaller bin. Cement is reclaimed from auxiliary bin into undertrack screw unloader for recharging into top bin, as needed. Schramm 315-cfm. compressor keeps cement aerated in bins.

THE TIGER BRAND SPECIALIST VISITS THE PENN-LINCOLN PARKWAY

and learns a trick or two about wire rope care

"I stopped to see Charlie Dinardo the other day. He's in charge of Dinardo, Inc.'s job of building the 980-foot concrete arch bridge over Nine Mile Run in the Penn-Lincoln Parkway project at Pittsburgh. It's one of the biggest concrete arch jobs in the country in recent years.

"About 15,000 yards of ready-mixed concrete go into this bridge, and 98% of it is being poured by cranes--all equipped with Tiger Brand Wire Rope. They were pouring about 250 yards a day, using a one-yard bucket on a crane equipped with a 105-foot boom and 18-foot jib. In addition to the pouring, the four cranes have handled all steel erection and form setting on the bridge. A job like this really puts rope to a test!

SUPERINTENDENT Charlie Dinardo tells the Tiger Brand Specialist how he obtains maximum life from his Tiger Brand Wire Rope on this rugged job.

"Charlie says he is getting plenty of service from his Tiger Brand Rope. It holds up for three months' steady work on the hoist, and he hasn't replaced a boom rope in over a year.

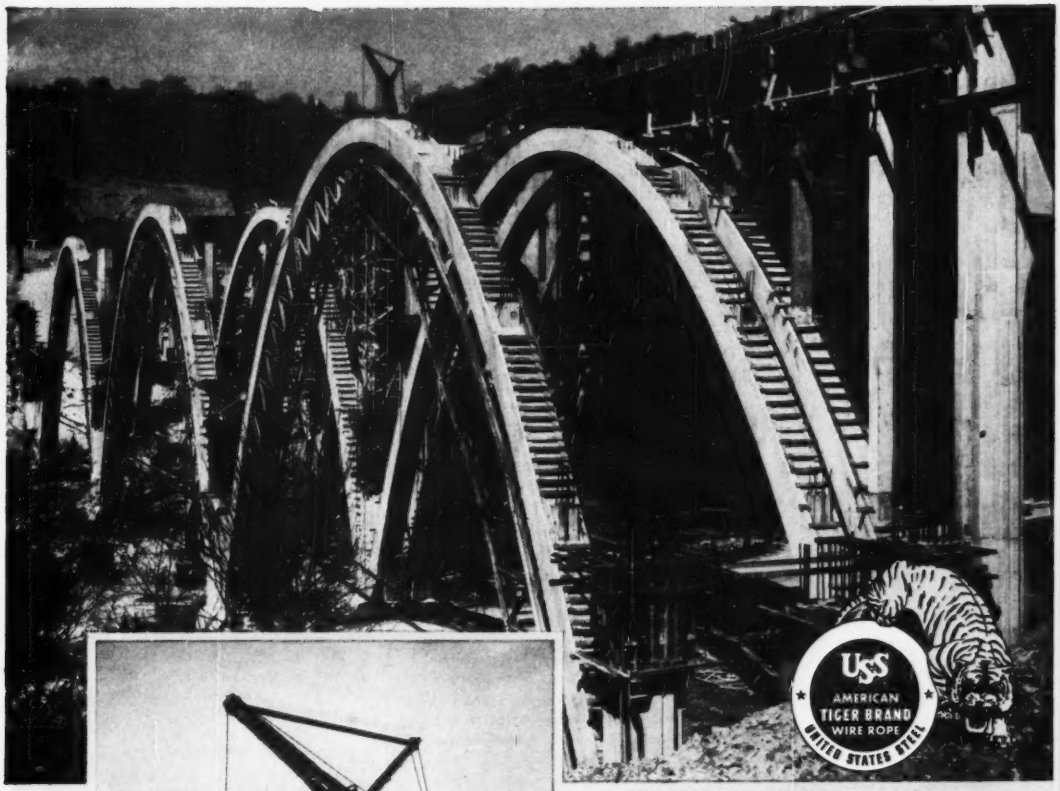
"Charlie passed on a couple of tips on how he gets this kind of service on such a rugged job. First, he uses nothing but Tiger Brand. Second, he observes extra precautions during installation, being especially careful not to introduce any twist into the rope.

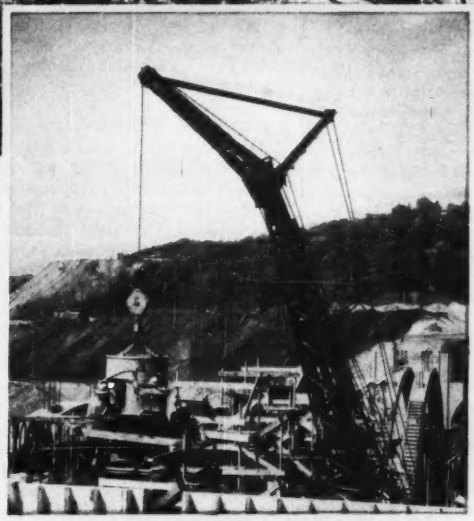
"That's this veteran contractor's method of obtaining exceptionally long rope life. I'm glad to pass it along to you."

ARE YOU GETTING THE MOST FROM YOUR WIRE ROPE?

The TIGER BRAND Specialist—an experienced field service engineer—draws on his own experience and that of veteran construction men like Charlie Dinardo to help you get the best performance from your wire rope at the lowest possible cost.

He'll be glad to talk over your problems with you and make suggesitons. Meanwhile, write for our booklet "Valuable Facts About the Use and Care of Wire Rope." You'll find it helpful.





980 FEET LONG . . . 100 feet high at the lowest point in the valley . . . this three span concrete arch bridge carries the new Penn-Lincoln Parkway west toward the Squirrel Hill Tunnels in Pittsburgh, Pa. Dinardo, Inc., Pittsburgh, is the contractor.

98% OF THE CONCRETE in this job is being poured by cranes—equipped with Tiger Brand Wire Rope.

AMERICAN STEEL & WIRE COMPANY, GENERAL OFFICES: CLEVELAND, OHIO
COLUMBIA STEEL COMPANY, SAN FRANCISCO
TENNESSEE COAL, IRON & RAILROAD COMPANY, BIRMINGHAM, SOUTHERN DISTRIBUTORS
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

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Cleveland 13, Ohio

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UNITED STATES STEEL

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CRANES UP TO 15 TONS
Fully Convertible

UNIT BUILT FOR ALL-AROUND *Heavy-Duty Service*

UNIT is tough! UNIT is versatile! That's why you can use UNIT on any type of job requiring shovel, clamshell, magnet, dragline, trenchoe, grapple or backfiller. And it's easy to change from one attachment to the other, right on the job. UNIT gives you all the power and speed you need, plus these exclusive features: Automatic traction brakes . . . Disc-type clutches . . . Drop forged alloy steel gears...Splined shafts...One-piece cast gear case ...Straight-line engine mounting. Mobile and Crawler Models Available

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CRANES • TRENCHOES • MAGNETS

Stang WELLPOINT SYSTEM

The Stang System has proved its efficiency and economy on both large and small jobs all over the United States. Stang engineering and supervision in planning, installation and operation insures a DRY JOB at all times.

For KNOW-HOW • ENGINEERING • SUPERVISION • EQUIPMENT • to keep jobs DRY

JOHN W. STANG CORPORATION
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(Continued from page 95)

placing of forms. The last stretch of concrete pavement was completed on Sept. 8, and the shoulders were dressed and the job was cleaned up by cold weather.

Grading and drainage structures were completed last year under another contract. By the end of next year the entire 65 mi. of new location from Winnipeg to the Canadian-U.S. border is expected to be completely paved with 24-ft. concrete roadway and 10-ft. asphalt shoulders.

Similar to their U. S. counterparts, the Brabant Brothers located their batching plant midway of the project. Aggregates and cement were shipped in by rail to a special 40-car spur.

Pavement forms were set to grade and alignment, form stakes driven by compressed air, and the subgrade prepared to receive the concrete, by a subgrader operating on the forms. Excess material windrowed along the outside of the forms was bulldozed into stockpiles, hand shoveled into trucks, and wasted along the shoulders of the embankment. A 5-ton roller then gave final compaction of the subgrade, which was checked for proper depth by a scratch template operating on the forms.

Poured One Lane at Time

Since there was only one set-up for the batching plant, the contractors elected to pour one complete 12-ft. lane at a time for the full length. This kept the aggregate trucks off the shoulders, since they could operate either on the half-width of unpaved roadway or on the completed 12-ft. lane. Best day's paving was 3,240 ft. of 12-ft. pavement.

Side forms were kept 2,000 ft. ahead of the paver to give plenty of working length for the subgrader, roller and check template.

The 8-in. concrete pavement, reinforced with a welded mat of ½-in. reinforcing bars spaced 24 in. each way, was poured in a single pass. The reinforcing mat, placed 4 in. below top of pavement, was supported on three-legged metal chairs. The chairs were removed just ahead of spreader.

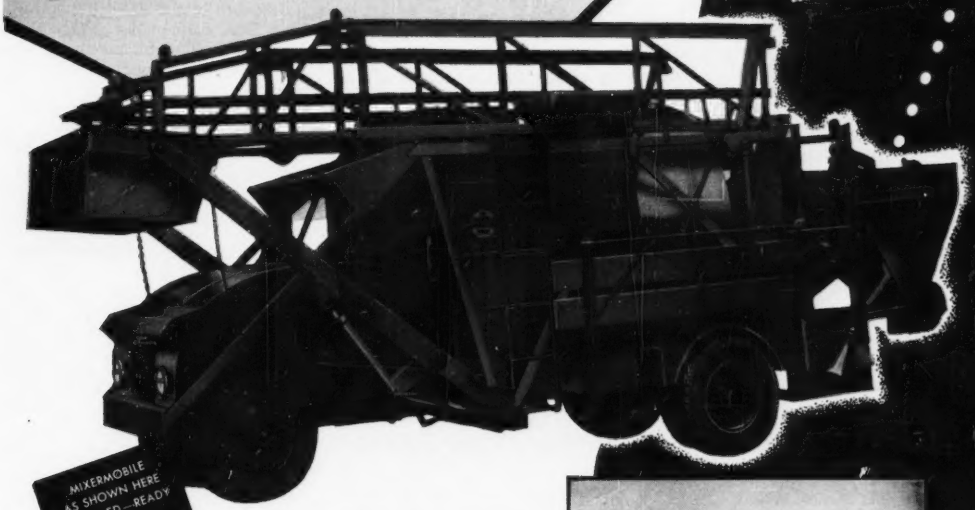
Following the spreader—Blaw-Knox latest vibrator model—came the concrete finisher, hand-belting to remove excess moisture, and a bullfloat, for the final finish.

The air-entrained concrete pavement was cured with a Masterkure and Rite-Cure, membranous curing compounds. Full-depth expan-

(Continued on page 100)

It's New.. the one-yard MIXERMOBILE

A complete mobile concrete mixing unit and elevator



MIXERMOBILE AS SHOWN HERE IS FOLDED—READY FOR TRAVEL

GREATER PROFIT ON EVERY JOB...

The new one-yard Mixermobile Model M-6 built to fit all jobs, both small and large. Its complete mobility means more jobs covered every day.

SAVES money by using dump trucks—mixes concrete on the job.

SAVES cost of erecting tower—35-ft. tower attached.

SAVES cost of hoist and storage hopper—included with tower.

SAVES time—drive to the job, ready to mix in five minutes. When pouring is finished drive to next job.

Turns out 200 cubic yards of concrete per day.

Use MIXERMOBILE — the most economical method of handling concrete on the job. Cuts labor costs—no time wasted waiting for concrete. One man operates complete unit.

FEATURES: HYDRAULIC CONTROLS.

MIXER COMPLETELY ENCLOSED—controlled by specially designed shaft (gears enclosed on outside, no contact with cement.)

POWERED BY V-8 FORD ENGINE.

DISCHARGE TIMER

FOOL-PROOF WATER CONTROL SYSTEM.

WEIGHT—20,000 lbs.

Will pass all highway limitations.

WRITE TODAY FOR LITERATURE AND YOUR NEAREST DEALER

- 35-FT. TOWER lifts concrete in hoist bucket and empties into tower hopper. Eliminates cost of cranes and moving to and from the job. Extension may be had by special order.
- HYDRAULIC CONTROLLED SKIP holds 1 cu. yd. Loaded directly from dump trucks.

MIXERMOBILE MANUFACTURERS

6855 N. E. HALSEY STREET, PORTLAND 16, OREGON

2 TYPES OF ATHEY TRAILERS

for every hauling job!

These heavy-duty trailers are mounted on Athey Forged-Trak Wheels, whose broad load-supporting tracks limit penetration into the ground and provide raised rails for easy rolling of the track wheels. The bodies of both of these trailers are constructed of high carbon steel to withstand the shock and abrasion of loading and dumping solid materials. All this means bigger payloads. Over rough, sharp rocks — over soft muck and mire — uphill or down — these trailers make their way surely and surely pay their way with continuous big-capacity performance.

2-WAY DUMP TRAILER

The shovel is loading an Athey 2-Way Dump Trailer — on a West Virginia job that involves moving 160,000 yards of rock. Length of haul: 600 feet; average load: 8 pay yards. The "Caterpillar" D8 Tractor handles this loaded trailer with ease, anywhere on the job.

SIDE DUMP QUARRY TRAILER

On a coal-stripping operation near Garden Ground, West Virginia, this Athey Side Dump Quarry Trailer hauls its capacity loads anywhere, in any weather, and dumps overburden clear over the edge of the bank.

Athey Products Corporation, Chicago 38, Illinois

Athey APCOR Products

Depend upon your Athey-"Caterpillar" Dealer to specify the type and size of Athey Forged-Trak Trailer that fits your needs.

Athey FORGED-TRAK TRAILERS

(Continued from page 98)

sion and contraction joints, filled with 1-in. timbers, were spaced 100 ft. apart. The two strips were tied together at centerline with ½-in. rods spaced 3 ft. apart.

Upon arrival at the batching plant, the cement hopper cars were unloaded by an undertrack screw unloader. Bucket elevators charged the cement into a 200-bbl. batching bin. The cement batching plant also had a 400-bbl. auxiliary bin, fed by an overflow pipe from the 200-bbl. bin. The larger bin was mounted directly over the undertrack screw unloader for reclaiming the cement and recharging the 200-bbl. bin, as needed. Both bins were piped for cement aeration.

Sand and gravel were charged into a three-compartment 100-ton bin, by cranes equipped with Blaw-Knox clamshell buckets. Batches were weighed on a two-beam scale and discharged into two-batch and three-batch aggregate trucks.

Of particular note on this job was the conscientious lubrication and maintenance of the equipment. During the lunch hour, both the concrete spreader and finishing machine were thoroughly cleaned with a water hose. Both government officials and the contractors took great pride in the project—working in unison to secure the fastest progress and best workmanship possible.

* * *

Blaw-Knox Packaged Equipment

1—Model G subgrader (10 to 13 ft.), with moving trucks and extra rubber-tired wheels for operating on finished slags.

1—Model SD spreader (10 to 15 ft.), with vibrator, moving trucks and rubber-tired wheels for operating on one finished slab.

1—Model XE concrete finisher (10 to 15 ft.) with standard screeds, moving truck and rubber-tired wheels for operating on one finished slab.

10,000 ft. of 8x8¼-in. self-aligning road rails.

1—P-3100 portable batching bin equipped with a 63-B batcher. Bin has a capacity of 100 tons in 3 compartments, and the batcher is capable of producing the size batch used with 34E paver operation.

1—Portable bulk cement plant with 200 bbl. storage above the BC-1 cement weighing batcher, and 400 bbl. in an auxiliary storage bin. This cement plant, complete with undertrack screw, 50 ton-per-hour cement elevator, and the 1-yd. cement batcher is capable of producing a batch for a 34E dual drum paver.

1—Multifoot 34E dual drum paver (Shipped from Nunda, N. Y.).

Constructing 4-inch crushed stone base for Texaco Asphalt Macadam surface on a New Jersey highway.

Applying Texaco Asphalt to 3-inch crushed stone wearing surface at rate of 1.78 gal. per square yard.

Spreading small stone to fill voids in the 3-inch surface course.

Follow these Steps

for a rugged, economical pavement

A long-lived pavement with a low upkeep cost, Texaco Asphalt Macadam calls for a minimum of large equipment in its construction. An asphalt distributor, roller, blade grader and trucks for hauling aggregate are the only large units required.

Texaco Asphalt Macadam is a good all-around pavement, equally satisfactory for roads, streets, airports or parking areas. The aggregate for the foundation and the wearing surface may be crushed stone, crushed gravel or crushed slag, depending upon availability and cost.

Usually, asphalt cement serves as binder in a Texaco Asphalt Macadam pavement. However, in modified forms of this type of construction, a Texaco cutback asphalt or an emulsified asphalt is substituted for the asphalt cement.

For a complete description of Texaco Asphalt Macadam paving and its modified forms, send for the booklet, "Road Building with Texaco Asphalt by the Pressure Distributor Method."

Samuel Braen's Sons, Hawthorne, New Jersey, were the contractors on this Texaco Asphalt Macadam project in Passaic County, N. J.

The second application of Texaco Asphalt calls for 0.72 gal. per square yard.

Covering again with small stone to fill voids and insure dense, waterproof surface.

For a seal coat, Texaco Rapid-curing Cutback Asphalt is applied at rate of 0.28 gal. per square yard.

The completed Texaco Asphalt Macadam pavement is durable, easy-riding and skid-resistant.

THE TEXAS COMPANY, Asphalt Sales Dept., 135 E. 42nd Street, New York City 17

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(THE NAME TO REMEMBER)

BODIES & HOISTS

Photos show PERFECTION Model 254 Dump Body with full cab guard, side boards and top box; capacity 12 yd.; mounted with PERFECTION Model 727 Iso-Draulic ROLL-A-LIFT.

Write for Complete Information

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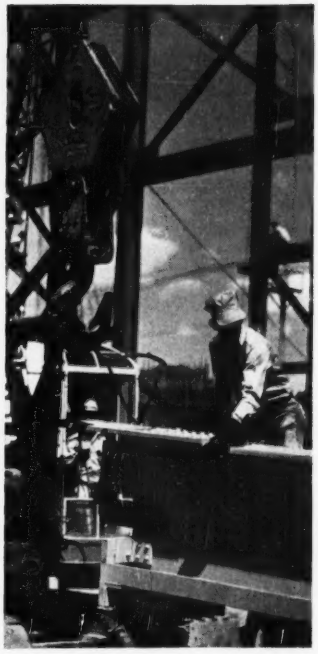
FOR ANY TRUCK STANDARD or SPECIAL UNITS IN ALL SIZES • FOR ANY USE

Offset Hitch Plumbs



SIMPLE DOUBLE STRAP HITCH, bent to right angle, holds eccentric columns plumb for easy setting over anchor bolts on Arapahoe Power Plant in Denver.

SPOTTING COLUMNS over four anchor bolts is easy because of special hitch. This sure beats jockeying a tipping column around to try to set steel without stripping anchor bolt threads.

Eccentric Columns

MAIN COLUMNS for the new Arapahoe Power Plant under construction for Public Service Co. of Colorado in Denver are eccentric because of a heavy channel along the inside flange to carry overhead cranes. In setting these columns, it was essential that they hang plumb from the crane hook to facilitate lowering them over four anchor bolts precast in the column pedestals.

John Beasley, steel erection subcontractor for Ebasco Services, Inc., general contractors on the project, rigged up a neat offset hitch that counterbalances the eccentric weight and holds the column plumb. As the photo shows, it is a simple pair of heavy iron straps bent to a right angle and welded together by a separator block. The straps straddle the column web, with the vertical leg bolted to splice holes in the web and the horizontal leg bolted to the column splice plate. The crane hook clevis is pinned through the corner hole. This simple hitch holds the column plumb when lifted by the crane hook.

Don Long took the photos. B. A. Snow is in charge of the job for Ebasco Services, Inc.

Motley Stone Wall

MORE THAN 2,000 SPECIMENS of stone from 47 states and 16 foreign countries have been laid as facing on an experimental wall erected at the National Bureau of Standards in Washington.

Studies will be made throughout the coming years of the weathering effect on the different stones to help future selection and predict durability in various locations.

CASH FOR PICTURES

Send in your job photographs for the monthly CONSTRUCTION METHODS and EQUIPMENT Readers' Picture Page. A minimum of $5 is paid for each acceptable photo. Bonuses up to $25 are awarded each month for outstanding pictures. Send them in to the Picture Page Editor.

"Our men go for these new Sterling Wood-Handle Barrows because they go for us, so quickly and easily. The wood handles are longer, formed to fit the operator's hands. Steel channel legs and reinforcements were designed for maximum leg clearance. But the feature we like the most is Sterling's BALANCED CONSTRUCTION. It puts 80% of the load on the wheel . . . only 20% on the operator. That certainly lightens the load for fast, easy wheeling."

STERLING S-12 — Sturdy wood-handle barrow designed for transporting dry materials. Tray is all-welded — no rivets — double lapped at corners. Heavy duty malleable wheel guard. 3½ cu. ft. capacity. Barrow is equipped with 12 spoke steel wheel. Roller bearing wheel with pneumatic tire or zero pressure cushion-type wheel, also available.

STERLING S5W — Same as above but with 4 cu. ft. capacity and equipped with roller bearing wheel and pneumatic tire. Tray is all-welded — no rivets — double lapped at corners. Heavy duty malleable wheel guard. 12 spoke steel wheel or zero pressure cushion-type wheel, also available.

STERLING S-18 — Another easy-wheeling barrow designed for handling concrete, mortar and similar materials. Maximum capacity 4½ cu. ft. Tray is all-welded—no rivets—double lapped at corners. Heavy duty malleable wheel guard. Barrow equipped with 12 spoke steel wheel. Roller bearing wheel with pneumatic tire or zero pressure cushion-type wheel, also available.

STERLING S-19 — Same as Model S-18 above, but with 5 cu. ft. capacity and equipped with roller bearing wheel and pneumatic tire. Tray is all-welded — no rivets — double lapped at corners. Heavy duty malleable wheel guard. 12 spoke steel wheel or zero pressure cushion-type wheel, also available.

STERLING WHEELBARROW CO., Milwaukee 14, Wis., U. S. A.

Look for this Mark of STERLING Quality

Sterling S WHEELBARROWS

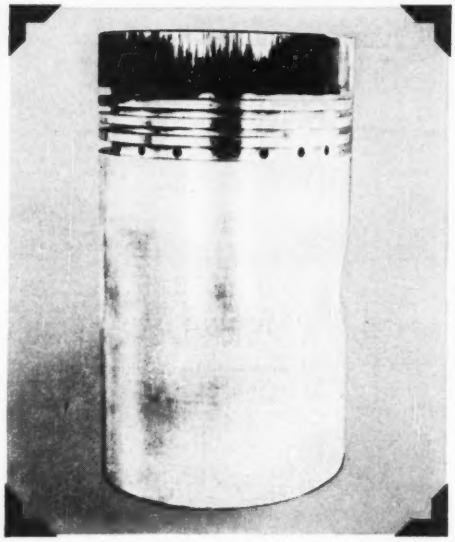
STANDARD ENGINEER'S REPORT

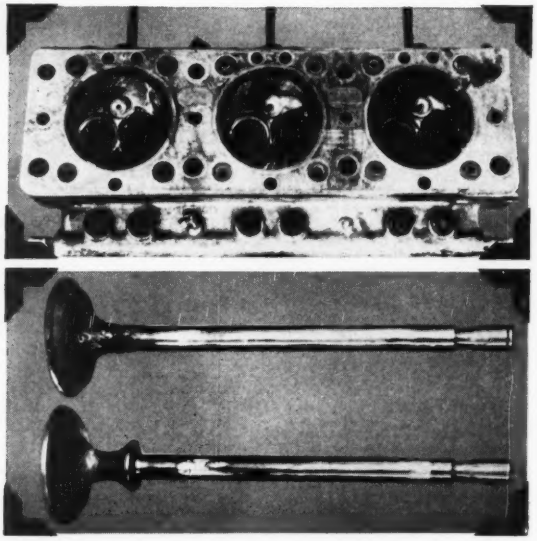
RPM DELO

TEST DATA

LUBRICANT	RPM Delo Supercharged Lub. Oil
UNIT	Caterpillar Diesel - D13000 5¾ x 8"
CONDITIONS	Cont. high load - Pumping water
FUEL	Regular commercial Diesel fuel
TEST PERIOD	4 months
LOCATION	Coolidge, Arizona

CYLINDER WEAR REDUCED 75% BY NEW LUBRICATING OIL





RPM DELO SUPERCHARGED LUBRICATING OIL held cylinder wear to 0.0007 inches per 1000 hours in a stationary Diesel where ordinary heavy-duty type oil had allowed over four times more wear, or 0.0031 inches. The piston, head, and valves above, photographed after they had operated in the engine 965 hours under severely accelerated conditions on RPM DELO Supercharged, are typical of the excellent condition of parts and cleanliness maintained throughout the engine by this newly developed oil. All piston skirts were varnish-free, all oil-return holes open. Average ring-gap increase per 1000 hours was reduced from 0.01625 inches to 0.00350 by the use of RPM DELO Supercharged Lubricating Oil.

REMARKS: This new product in the RPM DELO line is specially compounded to solve ring-sticking, deposit formation, and excessive wear problems in Diesel engines operating in extra hard service. Many field tests have proved it to be particularly valuable where continuous high loads or high-sulphur content Diesel Fuels cause these conditions.

In the test reported here, the engine ran the full 965 hours at approximately 90% of governed full load engine rating. Drain periods were extended to 240 hours, however all 24 piston rings remained free, no troublesome deposits formed in the ring belt or on other parts, and oil compound depletion was negligible.

Besides providing unusual resistance to oxidation, the compounds in RPM DELO Supercharged Lubricating Oil clean existing gum and lacquer from parts, prevent internal rusting and bearing corrosion and stop oil foaming.

STANDARD OIL COMPANY OF CALIFORNIA • San Francisco
THE CALIFORNIA OIL COMPANY • Barber, N.J., Chicago, New Orleans
STANDARD OIL COMPANY OF TEXAS • El Paso, Texas
THE CALIFORNIA COMPANY • Denver, Colorado

The Labor Union Monopoly Bites *ALL* Workers

What kind of government is it which:

. . . Prosecutes the Great Atlantic & Pacific Tea Company which it asserts handles about 6½% of the retail food distributing business as an illegal monopoly in restraint of trade, and

. . . Seeks to break up four big meat packing companies and make them into 14 companies, charging the four with being a monopoly in restraint of trade, but

. . . Makes no move whatsoever to apply the federal anti-trust laws to the exercise of virtually 100 percent monopoly control of labor in the coal industry, and the only slightly less complete monopoly control of labor in the steel industry?

The answer to that question is simple. It is class government of the most flagrant type, a government by which special privileges are dispensed without justice and to the great injury of all workers. It is the kind of government which will lead to the early sacking of the American enterprise system and the personal freedoms of workers.

In legal terms the explanation of this flagrant affront to good government is also simple. In 1932 labor union activities were given virtually complete exemption from the application of the federal anti-trust laws by passage of the Norris-LaGuardia Act.

continued on next page

When the Norris-LaGuardia Act was passed labor unions were relatively weak. Only about 16% of the nation's industrial workers were organized, only about 12% of the steel workers. About two-thirds of the coal miners were union members, but only half that number were paying dues. The country was in the depth of its worst depression. The unemployment of about one-fourth of the labor force made monopoly control by labor seem so remote as to be almost fanciful.

But after only seventeen years devoted to the promotion of labor union organization by the federal government, we have labor monopoly with us. In its power and scope it makes the alleged business monopolies being prosecuted under the federal anti-trust laws seem positively piddling. In its manners it makes the old-time business monopolists look like Lord Fauntleroys.

What is lacking, grievously lacking, is action by Congress; action to shape our federal anti-trust laws to take account of the labor monopoly that has become the dominant national force in our country today—a force that is leading to the loss of freedom of all workers.

Before labor monopoly is broken up, as it must be broken up if our economy is not to be permanently wrecked, other steps will no doubt be required. But one test more than any other will be the touchstone of the nation's determination to keep its economic and personal freedom. It is what it does to see that labor monopoly receives the same treatment under the federal anti-trust laws as any other kind of economic monopoly.

The purpose of the federal anti-trust laws is to break up monopoly and preserve fair competition in the United States. It is a fine purpose. The wisdom and fairness of its application in particular cases is often open to challenge. But in spite of bad administration every farsighted business man I know is a staunch defender of our national anti-trust policy.

At present, in the exemption of labor monopoly, we have a breach in that policy which, if not closed, will soon become fatal both to the policy and the enterprise system it is designed to foster and protect.

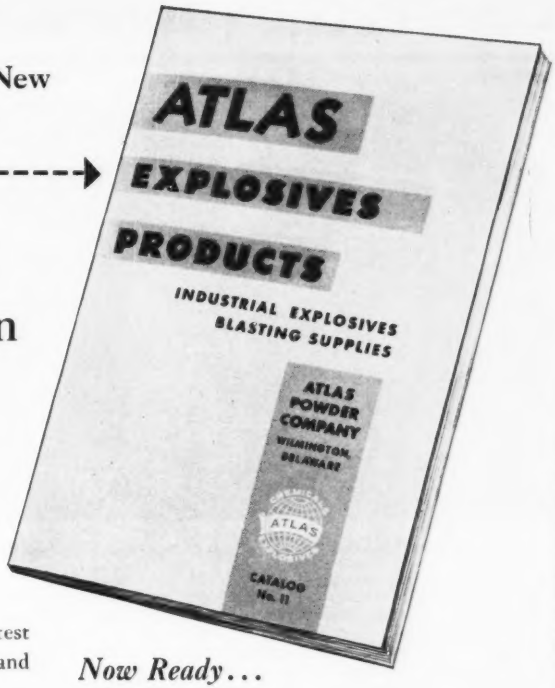
The main thing wrong today with Great Britain and indeed all Europe is that no effective anti-trust laws are in existence to protect the public from business and labor monopolies, to guarantee personal freedoms. No free economy in Europe or America can prosper as long as protected monopolies remain and flourish.

While your representatives in Congress are home with you talk to them about the special privileges now granted to labor union monopoly. You would serve your country well by finding out what they intend to do about it before it is too late.

President, McGraw-Hill Publishing Company, Inc.

There's Always Something New
in an Atlas Catalog

Here's The Latest Word on Industrial Explosives!



Now Ready...

THE new Atlas catalog is packed with latest information on explosives, blasting supplies, and accessories.

This book gives you facts to help you choose the *right* explosives products for *your* job. It includes up-to-date information about the complete Atlas line of explosives and blasting supplies for construction, quarrying, coal mining, stripping, demolition . . . including ROCKMASTER "16", the latest development in the original milli-second delay blasting system pioneered by Atlas.

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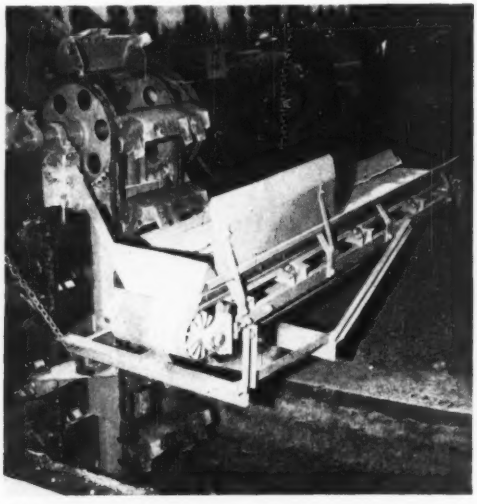
CONSTRUCTION EQUIPMENT NEWS • • *A Preview of*

By MELVIN DEAN, Equipment Editor

Low-Cost Self-Propelled Aggregate Spreader Features Positive Strike-Off

Low-cost machine accurately lays base and surface aggregates, free-flowing bituminous mixtures, and plant-mixed stabilized soil. Features include: Positive strike-off assembly rides independent of any up-and-down motion of the machine and constantly averages out any irregularities in the subgrade; all traction is on the subgrade with no displacement of the loose, newly laid material; quickly and easily adjustable from 8- to 12½- ft. widths; and screed accurately lays to any specified thickness including adjustment for crown, wedge, or leveling course. Other features include a 2-ton hopper, powerful 4-wheel drive, speeds up to 100 fpm., and hydraulic hand pump and ram lift the screed and runners up to 5 in. Power is supplied by 37.5-hp. gasoline engine. Specifications: Width, 11 ft.; length, 9 ft. 6 in.; weight, 9,750 lb.—**The Jaeger Machine Co., Columbus, Ohio.**

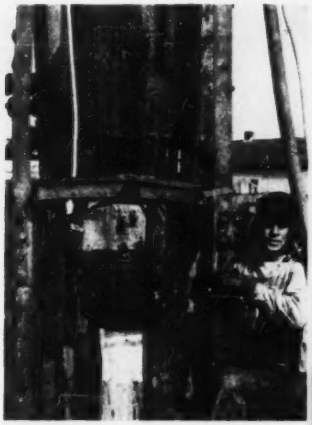


LIGHT-DUTY TRENCHER—Utilizing an endless cast-manganese-steel chain, the Ederer trencher digs an 18-in.-wide trench to a maximum depth of 55 in. This tractor-operated machine moves forward at speeds up to 6 fpm. Earth is dumped by buckets on to a conveyor which piles it 70 in. from the center of cut. Designed for installation on Ford or Ferguson tractors, it is operated from a power take-off.—**Ederer Engineering Co., 2931 First Street, Seattle, Wash.**

CLOGLESS PUMP—Bladeless impellers are secret of non-clog performance of line of trash and sewage pumps. The impellers contain a single channel, warped and twisted to produce the equivalent of a one-flow section. The line includes pumps in 2- through 5-in. sizes for low, moderate, or high-pressure service in horizontal, vertical wet pit, vertical dry pit, and vertical close-coupled construction.—**Fairbanks, Morse & Co., 600 S. Michigan Ave., Chicago 5, Ill.**

New Machinery, Tools and Equipment That Will Help You on the Job

NEW MODEL TRUCKS—Re-designed line of trucks is heavy-duty engineered. The L-line consists of 87 separate truck chassis models designed to handle every conceivable type of hauling job. Features include: Increased safety and comfort, new chassis dimensions, permitting better load distribution and greater maneuverability, and improved valve-in-head engines, including the all-new Silver Diamond series. The L-line is spearheaded by four classifications of 4-wheel model trucks—the Standard, Loadstar, Roadliner, and Schoolmaster buses. A complete line of transmissions is available. Rear axles include hypoid single-speed double reduction and two-speed units with electric shift.—**International Harvester Co., 180 N. Michigan Ave., Chicago 1, Ill.**



RECORDS ACTION OF PILE HAMMERS—Electrically operated Penetrometer makes a permanent record of the action of piledriving hammers. The tape provides a permanent record of number of seconds to drive pile, number of blows, idle time, penetration gained by each blow, and number of blows and penetration for each foot of the driving.—**A. Byron Hunicke, Spring Hill, Ala.**

TEN-TON REAR-DUMP TRUCK—Powered by a 125-hp. diesel engine, the Model UD has a struck capacity of 6.6 cu.yd.; payload capacity of 10 tons. Designed for off-the-highway hauling, it has a top speed, with capacity payload, of 35.7 mph. Features include planetary drive axle, low-speed heavy-duty transmission, 3-stage double-acting hydraulic hoist, and free-floating spring mounting for front and drive axles.—**The Euclid Road Machinery Co., Chardon Road, Cleveland 17, Ohio.**

HALF-YARD EXCAVATOR—Crawler-mounted Model 66 excavator can be used as trench hoe, shovel, dragline, clamshell and a magnet, or 7.5-ton utility crane. Standard power unit is a 62-hp. gasoline engine; however, other gasoline or diesels are available. Swing speed is 6.2 rpm.; weight as trench hoe is 30,398 lb. Crawler is powered through direct-drive propeller shaft assembly from direct-power-flow transmission.—**Wayne Crane Division, Fort Wayne 1, Ind.**

THE Thoro System

Water is precious and valuable for many services and leakage through crevices in rock berm permitted the water to waste out of this dam on the property of a large Natural Gas Company.

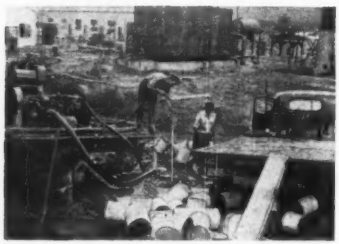
Do you have masonry problems?

They can be corrected with THORO System Products

WATERPLUG — STOPS LEAKS
THOROSEAL — SEALS SURFACE
QUICKSEAL — BEAUTIFUL FINISH

Everything is ready to pump 3600 lbs. WATERPLUG into the rock berm, to seal the crevices. Five minutes was required to pump material into place.

The pressure gauges are watched carefully to control the pumping operation and prevent clogging and setting in the pipes.



The pumps, hose and all equipment are washed and cleaned quickly to prevent hardening of WATERPLUG in the equipment.

Over 65,000 Contractors and Builders use these products as standard for protection of masonry, above and below grade.

Get our new 20-page brochure, with designer's guide. Pictorially described, in detail . . . "How to do it".

Standard Dry Wall Products
BOX X. NEW EAGLE, PENNA.

Look for These Next Month

There were several other important developments this month. However, space requirements did not permit us to describe them for you in this issue. Look for a description of these developments in the January issue of *Construction Methods and Equipment*.

- *Rear-dump trailer* allows dumping at extreme angle without danger of overturning or twisting the support arms.
- *Rubber-mounted swing loader* features full hydraulic operations and quick change to crane or backhoe.
- *Side-dump trailer train* has a 44-ton capacity; an automatic down-folding side door.
- *Truck-mounted oil-fired heater* for maintenance of asphalt surfaces.
- *Crawler-mounted 2-yd. power shovel* convertible to crane, dragline or clamshell.

AIR-OPERATED PUMP—Paintmaster pump permits spraying of paint directly from its original container. Two sizes are available—for 5 gal. pails and 55-gal. drums. The Paintmaster maintains density of color and retains viscosity of paint at all times by continuous agitation and by a circulating system which forces paint pigments to remain in constant suspension. Air pressure is used to power the pump and is not exerted directly on the paint.—**Gray Co., Inc., Graco Square, Minneapolis 13, Minn.**

HALF-YARD POWER SHOVEL—Production has begun on a half-yard "Quick-Way" power shovel. Equipped with a heavy-duty 30-ft. folding-type boom, the Model L has a 10-ton lifting capacity as a crane unit, and is easily converted to trench-hoe, dragline, or clamshell. Power is provided by an International U-9 engine developing 55 bhp. The basic machine weighs 12,000 lb. Standard equipment includes: Drum lagging, hold-in clutch levers, and a combination power trip and automatic tagline winder. Boom extensions are available in 5-, 10-, and 20-ft. lengths. —**"Quick-Way" Truck Shovel Co., 2400 E. 40th Ave., Denver, Colo.**

5 weeks of construction time saved *with*

LEHIGH EARLY STRENGTH CEMENT

Lehigh CEMENTS

• Dyckman Houses, Bronx, New York City, a project of the New York Housing Authority. • **General Contractor:** CAULDWELL-WINGATE CO., INC. **Contractor for superstructure:** CORBETTA CONSTRUCTION CO. **Ready-mixed concrete:** COLONIAL SAND & STONE CO., INC.

Here's an example of how forward thinking can speed construction all along the line. It was on the Dyckman Houses project in New York City's Bronx . . . seven 14-story buildings and a power plant. Six floors in each of the seven units had been poured when the approach of cooler fall nights called for typical Corbetta Construction Company planning.

In order to maintain the closely co-ordinated schedules for erecting forms, setting steel, placing and finishing the concrete, the Corbetta Construction Company, with characteristic foresight, changed to a quick-curing concrete made with Lehigh Early Strength Cement. And the result: Between September 12th and October 14th—in just 24 working days—41 floor slabs were poured; the way cleared for sub-contractors before winter set in; 5 weeks of construction time saved.

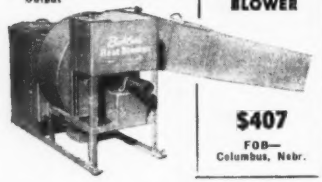
LEHIGH PORTLAND CEMENT COMPANY
ALLENTOWN, PA. • CHICAGO, ILL. • SPOKANE, WASH.

LEHIGH MORTAR CEMENT • LEHIGH PORTLAND CEMENT • LEHIGH AIR-ENTRAINING CEMENT • LEHIGH EARLY STRENGTH CEMENT

NEW! Heating Unit for Winter Jobs

- Ideal for Concrete Work
- Quickly Thaws Out Materials
- Over One Million B.T.U. Output

Behlen HEAT BLOWER

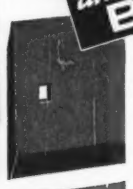


$407
FOB—
Columbus, Nebr.

A sturdy, dependable heating plant. Has many construction uses. Recommended for concrete work in low temperatures. Warms aggregate at batching plant; prevents freezing concrete while setting. Just the thing for drying and curing plaster or paint and other such jobs. Preheats machinery. Burns 1 to 9 gals. distillate or kerosene an hour; furnishes up to 1,100,000 B.T.U.'s direct heat per hour. Built-in fan delivers up to 7,000 CFM at ½ inch water pressure or 5,000 CFM at 5 inches pressure up to 250°F output. Gasoline or electric motor furnished if desired. Adjustable outlet pipe is removable for adapting to fit job. Mounted on skids. Used on Federal and private construction. Almost 3,000 in use on farms dehydrating corn. Beat weather delays . . . write, wire for full information . . .

BEHLEN MANUFACTURING CO.
DEPT. 8 COLUMBUS, NEBR.

Shunk Snow Plow and Ice Removal BLADES



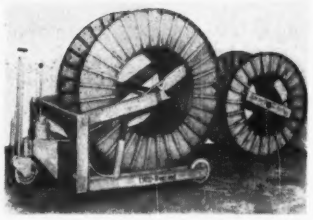
Proved record of superior performance. Made of specially developed steel to withstand severe service conditions.

FOR ALL TYPES AND MODELS OF SNOW PLOWS
Various widths, lengths, thicknesses--flat or curved--standard or special--punched ready to fit your machine.

SHUNK SAW-TOOTH ICE BLADE
Amazingly effective. Thoroughly breaks up and removes heavy, slippery ice and snow formations. Replaces all types of snow plow blades or maintenance units. Write for Bulletin and name of nearest Distributor.

ALLIED EQUIPMENT DISTRIBUTORS ASSOCIATION

Shunk MANUFACTURING COMPANY
ESTABLISHED 1854
BUCYRUS, OHIO.

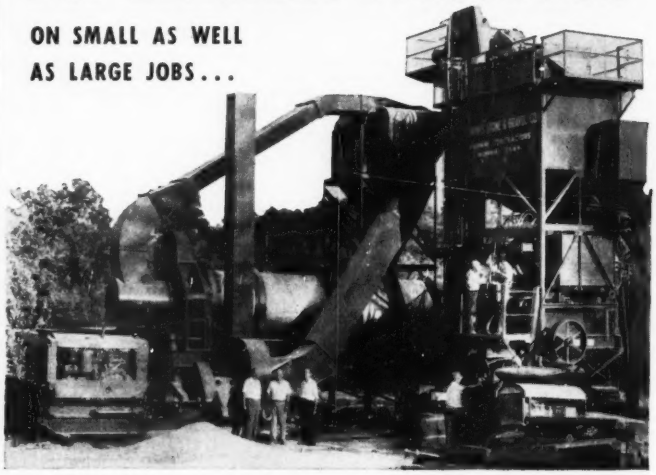


LIFT TRUCK FOR CABLE REELS—Cable-reel truck handles reels of various diameters and widths without requiring any adjustment. The lift arrangement incorporates two hydraulic hoists which raise the carrying arms of the truck. A single-speed hydraulic hand pump provides power to elevate the lifting arms. Available in capacities from 2,000 to 10,000 lb.—**Lyon-Raymond Corp., 13563 Madison St., Greene, N. Y.**

DETACHABLE DRILL BIT—One-use throwaway drill bit is adaptable to all rock-drilling applications. Made of forged and heat-treated steel, the outstanding feature of the Liddicoat bit is the pilot construction which chips the rock ahead of

For Efficient Production

ON SMALL AS WELL AS LARGE JOBS . . .



H&B Model PA Portable Asphalt Plants

MOTO-PAVER
The complete mixing and paving machine for mixed-in-place work. Write for Bulletin MP-47.

Shown above is the Hetherington & Berner PA-30 hot mix plant recently delivered to Memphis Stone & Gravel Co., Highway Contractors, Memphis, Tenn. These PA plants are designed to give efficient production on small as well as large jobs—under a wide variety of operating conditions.

PA plants may be driven with individual motors or from one main power unit for the tower and one for the dryer, using gasoline, diesel, diesel electric or electric power. They are easily portable by truck. Low overall height is maintained by using a flat screen, and can be further reduced by use of a depressed driveway. Write for Bulletin P-46.

HETHERINGTON & BERNER INC.
735 Kentucky Avenue, Indianapolis 7, Indiana

H&B Builds Portable and Stationary Asphalt Plants of All Types, Sizes and Capacities

the cross-wings and eliminates pulverizing action. The Type L bit is made for use with all conventional steel sections. Gage sizes are sufficiently varied to assure selection of bits suitable for any rock condition.—**Calumet & Hecla Consolidated Copper Co., Calumet, Mich.**

SELF-PRIMING JETTING PUMP—Pump, primed by engine exhaust, delivers up to 400 gpm. at 150-lb. pressure. Recommended for pile-driving jetting jobs, it can also be used for fire fighting, bank washing, caisson work, watering down fills and pavements, and mud pumping during drilling operations. These pumps are available in single-stage and multi-stage models.—**Sterling Machinery Corp., 405 Southwest Blvd., Kansas City 8, Mo.**

LOW HEAD CRANE BLOCK — Available in capacities from 10 to 50 tons, the new Lo-Head crane block can be used for all types of hook work. The new block, with its shorter over-all length, permits 1½ to 2 ft. higher lifts without lengthening the boom. The forged hook operates on Timken tapered roller bearings and the cast-steel sheaves are equipped with Hyatt Hi-Load bearings. Lubrication is necessary only once each 2,000 hr. Alemite fittings are provided for standard grease-gun use.—**American Hoist & Derrick Co., 63 S. Robert St., St. Paul 1, Minn.**

SAFETY-TREAD FLOORING—Perma-Tread is a heavy-gage cast-aluminum plate which has a fine silica-carbide grit material distributed through the casting and permanently bonded into its surface. It is available in various sizes up to a maximum of 6-ft. continuous length and 1-ft. widths in thicknesses of ¼, 5/16, and ⅜ in. Countersink or special mounting arrangements may be included in the mold.—**Mold-Cast Alloy Corp., 2140-A Montcalm St., Indianapolis, Ind.**

Simplex
UTIL-A-TOOL

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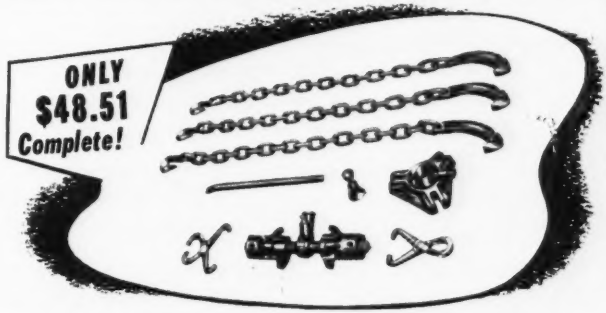
ON PUSHING • CLAMPING • HOLDING • PULLING • BENDING • LIFTING
SPREADING • LOWERING • PULLING WHEELS AND GEARS

A Low-Cost Work-Saver for Scores of Maintenance Jobs!

When you're stumped by a tough job, call on the Simplex Util-A-Tool to handle it easy, safe and fast. This handy, all-purpose, easily portable tool is quickly set up for fast action that saves time and muscle-power. It's "the tool of a thousand uses" for maintenance and repair.



10-PIECE SET INCLUDES — 10-ton Push-Pull Jack (extended by 1½" pipe in nut wells); No. 3A Spreader Jack (extended by 1" pipe in base and ½" pipe in cap); 2 drop-forged Sky Hooks (for pulling in); 3-Way Base and Wheel Puller; 3 Heat-Treated Chains ½" x 40" fitted with Grab Hooks and Claws; Chisel-Pointed Lever Bar and Heavy-Duty Tool Box.

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...AND SOME OF THE REASONS WHY ARE:

- **DEPENDABILITY**—Thoroughly tested on thousands of jobs over a long period of years, CLEVELANDS wheel-type design has been proved best. It digs cleaner, straighter, trench and digs it faster and cheaper even in the most rugged soils.
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- **MANEUVERABILITY**—Traveling on specially designed full wide crawlers, CLEVELANDS have that exact balance and hairline maneuverability so essential to ease of operation in rugged territory and in the close, cramped areas.
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SEE YOUR LOCAL DISTRIBUTOR AND LET HIM HELP YOU SELECT THE MODEL BEST SUITED TO YOUR WORK

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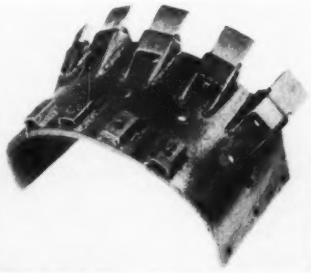
MAGNETIC TUBE HAMMER—Designed to simplify driving nails into inaccessible or hard-to-get-at locations. Nails inserted into the end of the tube are held in place by the magnetized tip of the hammer. A weighted handle is then used to drive the nail which is guided and held in place by the tube. Available in three sizes (12-, 18-, and 24-in. lengths), the tool will drive any nail from 6d to 20d sizes.—**Tube Hammer Mfg. Co., 1308 E. Colorado St., Pasadena 1, Calif.**

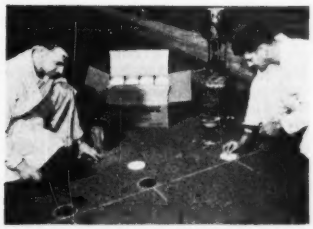
AUTOMOTIVE DIESEL ENGINES—Two new 6-cylinder high-speed diesel engines are designed for on-highway and off-highway automotive applications. Both the HRBB-600 (highway) and HRBBI-600 (off-highway) models have a maximum rating of 175 hp. at 2,000 rpm. Features include: Fully counterbalanced crankshaft, camshaft of new design, viscous-type torsional vibration damper, and revised fuel pump.—**Cummins Engine Co., Inc., Columbus, Ind.**

SNOWPLOW CONTROL—Feature of this hydraulic control for snowplows is that it has a pump with its own all-metal clutch, so that the pump operates only when power is needed. One finger-tip control knob raises the plow, holds it in position, or lowers it. Pump is mounted under the hood and operates off the fan belt.—**National Truck Equipment Co., Dept. SPK-27, 255 Madison St., Waukesha, Wis.**



POCKETS FOR TRENCHER TEETH—Weld-on pockets reinforce trencher buckets and provide a means of securely and quickly installing Jiffy self-sharpening reversible points. With this equipment, it is possible to replace a complete set of points in 30 min. The pockets are made of a cast-manganese steel. Available in two types to fit every type of trencher.—**Jiffy Products Co., 3611 Parry Ave., Dallas, Tex.**

CABLE-LOAD LIMIT SWITCH — Instrument operates an electric switch when cable tension reaches a predetermined value. Can be used with the holding coil of the hoist-motor magnetic starter to set an alarm circuit when load limit is reached. The unit can be applied to any wire cable from a ¼ to ¾-in. dia. without cutting or removing the cable. Load setting can be any value from 500 to 25,000 lb. single-line pull. An adjusting screw permits setting to any predetermined loading within the capacity of the switch.—**Martin-Decker Corp., 3431 Cherry Ave., Long Beach 7, Calif.**



PLASTIC LANE MARKERS—Molded, plastic 4½-in. disks are easily installed on asphalt or concrete roads. The Dur-O-Line markers are applied to asphalt by a special mastic adhesive, and are secured by driving a 2-in. pin through the marker into the asphalt. On concrete, installation is identical except that a ¼-in. hole, ⅝ in. deep is drilled through the marker and a 1-in. pin is used to secure it to the pavement.—**Traffic Safety Supply Co., 2700 N. E. Sandy Blvd., Portland 12, Ore.**

TEN-INCH SLIDE RULE — The Pickett 800 log log slide rule features a double, or back-to-back, scale. Features of this scale are: It places the six log log mated scales together to make three double scales with numbers and their reciprocals back-to-back for greater accuracy and easier reading; provides a C scale on both sides; permits inclusion of the DI scale; and the additional blank space made available results in a simpler-looking easier-to-use rule. All scales are decimally divided.—**Pickett & Eckel, Inc., 5 S. Wabash Ave., Chicago 3, Ill.**

FLAME COMBUSTION SAFEGUARD—Combustion safeguard for boilers, kilns, fuel-fired furnaces, and other heating equipment detects the presence or absence of a gas or oil flame on any type of burner. The 1300 Series Flame-otrol uses the flame itself as a link in a simple electronic circuit to provide instantaneous switching action.—**Wheelco Instruments Co., 847 W. Harrison St., Chicago 7, Ill.**

OWENS ARE 'WATERDOGS'

OWEN CLAMSHELL BUCKETS INSURE A BIGGER DAYS WORK

at HOME in the WATER . . . and 'DOGS' for PUNISHMENT

Owen Type DX Extra Heavy Duty Buckets are ideally suited for under water dredging operations. Sealed, grit-proof bearings are impervious to water and abrasive materials. Proper shell curvatures assure complete and rapid discharge of wet, sticky clay and sludge.

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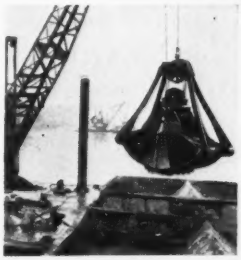

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FAMOUS EXAMPLES OF ARMORED CONSTRUCTION

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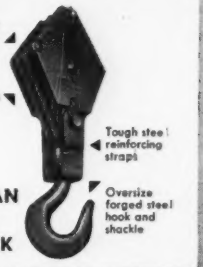
Extended, heavy steel side plates protect sheaves
Heavier pins and axles
Tough steel reinforcing straps
Oversize forged steel hook and shackle

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9301

Dropped, slammed and battered on the job, blocks and sheaves have to be *tough!* Compare AMERICAN *"armored construction"* . . . see why these blocks and sheaves serve better, last longer. Many types, all sizes, from 1½ to 250 tons, for wire rope only. Sold by distributors everywhere. Made by AMERICAN HOIST AND DERRICK CO., St. Paul 1, Minn.

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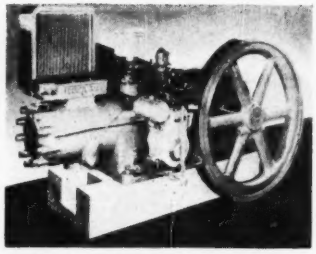
Dept. 19, 726 South Flower Street, Burbank, California.

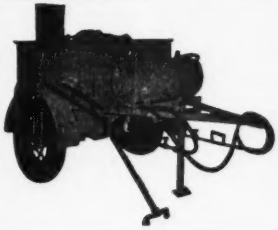
Please write for illustrative catalog on complete line of Viber equipment.



SINGLE-CYLINDER ENGINES—Lorain Model R engine develops 45 bhp. at 325 rpm.; the Model A produces 55 bhp. at the same speed. Both are of the horizontal single-cylinder two-cycle type. The R operates on natural gas; the Model A can be operated as a cold-starting full diesel, or converted to burn natural gas or butane. Over-all dimensions are: length, 110 in.; width, 74 in.; height, 68 in.; and shipping weight, 8,275 lb.—**White-Roth Machine Corp., Lorain, Ohio.**

ROOF-SURFACING MATERIAL—Double-action material for roof insulation and protection consists of a thick, creamy liquid of aluminum flakes bound to fine asbestos fibers by a waterproofing base and held in suspension by the special booster. Abesto Fiberated Lumiclad provides a reflective insulation value on the top of the roof, and an equal reflective insulation on the under side of the coating to hold heat in during cold weather. Coverage is 100 to 200 sq. ft./gal., depending upon the condition of the roof. It may be applied by brush or power spray equipment. —**Abesto Mfg. Corp., Wabash & Second, Michigan City, Ind.**

LOADER-BULLDOZER UNIT—Improved Southwest loader-bulldozer unit offers economy and efficiency for all loader and bulldozer operations. Attachments quickly convert tractors for use in specialized operations, such as highway and street maintenance and sand and gravel handling. Conversion takes as little as 30 min. to accomplish.—**Southwest Welding & Mfg. Co., Alhambra, Calif.**



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FRONT END SHOVELS
For Industrial Tractors

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Portable — Stationary
Write for Circulars

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ELKHART INDIANA

Machined from special alloy tool steel, oil tempered and hardened, ARMSTRONG BROS. Knife Blade Cutter Wheels penetrate pipe easily, cut smoothly and rapidly, and hold their keen edge. They come in sizes and types for all makes of pipe cutters.

Write for New S-48 Catalog, just released.

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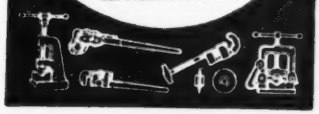
San Francisco 3, Calif.



DRUM UPENDING TOOL—Tool for upending drums and barrels features a special tension-clinching action for positive safety. V-shaped strap-iron saddles are located at the point of leverage and the point of lifting. The leverage saddle at the end of the E-Z Up laps over the top expanded rolling hoop, while the lifting saddle fits tightly to the drumhead at two points under the rim which supports the lifting weight. The E-Z Up is made of 1-in. tubing, is 42 in. long, and weighs 6 lb.—**The D. S. Campbell Co., 6110 Euclid Ave., Cleveland 3, Ohio.**

RUST PREVENTIVE—Rustarest No. 30 can be used on aluminum, chrome, and ferrous or non-ferrous metals. It produces a hard, tough coating but is pliable enough to take bending and curving. It dries quickly without need of baking.—**International Rustproof Corp., 12507 Plover Ave., Cleveland, Ohio.**

DOUBLE-IMPELLER BREAKER—Capacity of the Model 4040 double-impeller breaker is 150 to 250 tons/hr., breaking material up to 2½-in. size. Horsepower required is 150 to 200 (electric) or 220 (diesel). The 4040 is 17 ft. long, 11 ft. 6 in. high, 8 ft. 4 in. wide, and weighs 65,000 lb. The breaker can handle any material passing a 40-in.-square opening. It is V-belt driven with an individual drive to each impeller—**New Holland Mfg. Co., New Holland, Pa.**

MONEY MAKER

•SHOOTS STRONGEST CONCRETE FASTER

"Welding with Concrete" best describes the new CMC JETCRETE method of pneumatically applying concrete. JETCRETE is *the most nearly perfect concrete known today.* Wherever and whenever used, JETCRETE has done the job *better, faster —and at lower cost! The machine with a thousand uses!*

- *BUILDING* . . . walls, roofs, partitions, fences, fire retards, etc.
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- *WATERPROOFING* . . . Reservoirs, tunnels, tanks, drains, fissures, water basins, etc.
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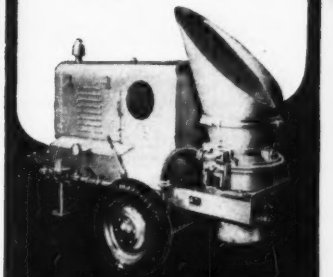
- *PRESERVING* . . . Brick, concrete, steel, tile, stucco, wood, iron, spillways, turbine chambers, piers, sewers, tunnels, etc.



Write for illustrated bulletin No. JG-348 showing JETCRETE in action.

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M·S·A

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SKULLGARDS keep their title to greatest popularity in industry through *dependable protection*—proved every day—and lightweight *wearing comfort*—proved every minute! Perfect balance, cushioned sweatband and shock-absorbing inner hammock mean dress-hat wearing ease! A variety of hat and cap styles to choose from—standard head sizes.

THE SKULLGARD WINTER LINING

Warm, snug comfort when cold winds blow! Tailored to fit smoothly, of close-weave greyfall cloth—zips into Skullgard, easily removed. Covers head, ears and back of neck.

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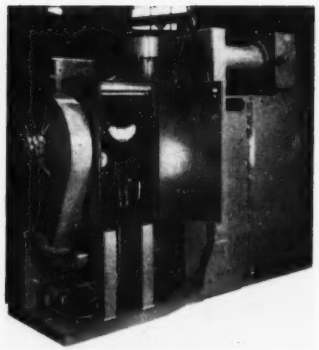
Braddock, Thomas and Meade Streets · Pittsburgh 8, Pa.

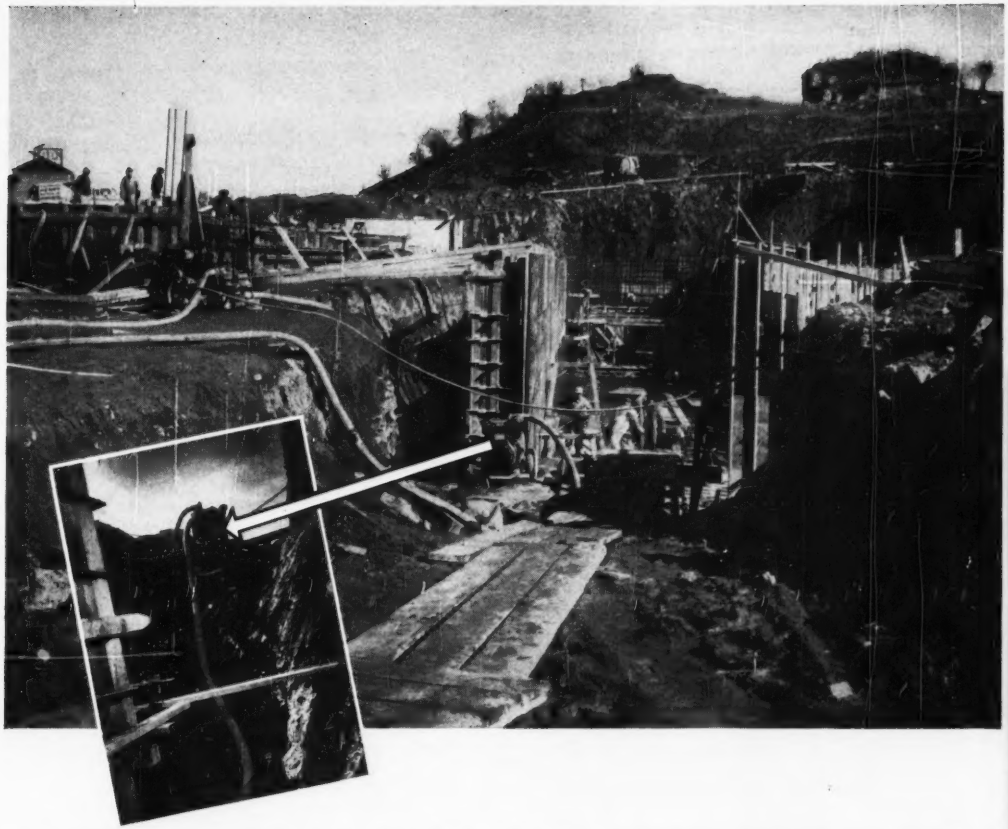
At Your Service: 54 BRANCH OFFICES IN THE UNITED STATES AND CANADA



HEATED AIR GENERATORS—Thag line of heated-air generators are available in two standard models, portable and stationary. They are capable of producing a steady supply of air with temperatures up to 600 deg. F. at 1,000 cfm. for drying or unfreezing wet sand or gravel, defrosting ice-covered machinery, and similar applications. When the fuel valve is opened by a push-button control, all moving parts go into coordinated action. The Model P, Type A, unit weighs 2,250 lb. and is equipped with handling gear for mobile use. The Model S, Type A, weighs 2,110 lb., and is similar to the Model P with the exception that it has no fuel tank or lifting gear and is designed for permanent installation. Both units produce 600,000 btu's.—**Todd Shipyard Corp., 81-16 Forty-fifth Ave., Elmhurst, Queens, L. I., N. Y.**

DRAWING-PEN CLEANER—Speedy cleansing agent removes dried waterproof drawing ink from pens and other non-absorbent surfaces. Pen Cleaner is harmless to instruments, brushes, hands, and clothing, and is non-inflammable. Available in ¾-oz. bottle equipped with cropper stopper; 2½-oz. wide-mouth jars with screw cap; and in 16-oz. bottles.—**Higgins Ink Co., Inc., 271 Ninth St., Brooklyn 15, N. Y.**

UNIVERSAL JOINT—The K2R universal joint features a cork washer and retainer on each of the four trunnion bearings to seal lubrication in and to keep dirt and grit out of working parts. It is available in complete assemblies or in single joints for use with many types of construction equipment.—**Blood Bros. Machine Co. Allegan, Mich.**



WATER MEANS TROUBLE TO A CONSTRUCTION MAN

Drainage and seepage water can be a big headache. It has to be handled in varying quantities on nearly every construction job. For instance, on the foundation work on this hillside factory building in North Bergen, New Jersey, the contractor had to contend with plenty of drainage. Mahony-Troast Construction Co., handling the job, had to keep the water down throughout a winter of snow, sleet, thaw and rain. The contractor wanted it handled without trouble and without a lot of bothersome maintenance.

On this job, as on many others, for the main pumping work this contractor used a Marlow Water Wizard Self-Priming Centrifugal Pump.

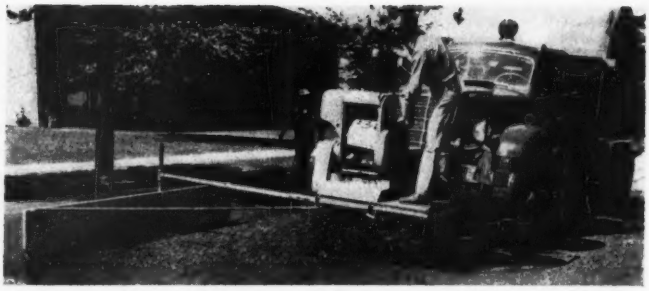
The Water Wizard never caused trouble. It never needed attention. Suction lifts varied from 18 to 27 feet and still there was never a halt in its smooth, even pumping. And when the Water Wizard got down to mud, a Marlow Mud Hog diaphragm pump joined in the drying work.

Performance like this is typical. The stamina and dependability of a Marlow Water Wizard can't be beat. It primes itself. There are no parts to jam or cause trouble. It pumps with the same high efficiency in either continuous or intermittent service. And to top it all, a Water Wizard is economical to operate.

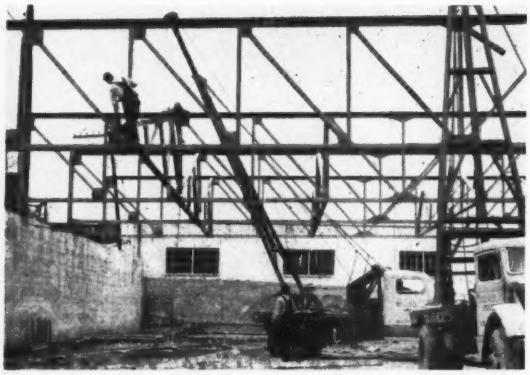
You'll find it worth your while to learn why more and more contractors rely on Marlows, the World's largest line of construction pumps. Ask your nearest Marlow distributor or write the factory.

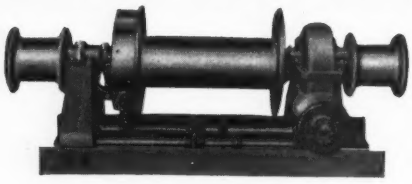
MARLOW PUMPS
RIDGEWOOD • NEW JERSEY

Spreader Casts Material in Front of Truck



FEATURE OF spinner-disk-type chip spreader is that it casts material in front of the truck on which it is mounted. This is accomplished by a heavy-duty conveyor belt that brings material forward underneath the truck. Sand, cinders, crushed stone, and trap rock up to ¾ in. are easily handled by the Roadsaver. Unit is controlled by the operator as he rides on front platform and watches all operations. Width of spread can be varied from 4 to 20 ft. Density or thickness of spread is controlled by changing the conveyor-belt speed. The conveyor belt is powered by a 20-hp. air-cooled gasoline engine equipped with a speed regulator. Spread can be directed to the right or left of the machine. Hydraulic jack and hand pump lift the machine for attachment to truck by a simple chain arrangement. Change - over time averages 1½ min. Material can be applied at rates up to a cu.yd./min. The Roadsaver spreader can be used with any standard dump truck equipped with 8.20 tires or larger. The Roadsaver has its own hopper for transferring material from the truck to the conveyor belt.—**Gabb Mfg. Co., 16 Orchard St., East Hartford, Conn.**





lift • load • pull • unload

TULSA WINCH

The All-Purpose Winch

makes construction jobs easier

For better winch performance, use Tulsa Winch — the choice of contractors and construction men. Winch models for all trucks — ½-ton and larger. Distributors in principle U. S. cities and Canada. Write for bulletin.

Tulsa Winch

TULSA, OKLAHOMA DIVISION OF VICKERS Inc

THREAD-SEALING COMPOUND—Available in stick form, Thread-Tite applied to pipe threads before joints are made up, provides a positive seal against water, steam, and other materials at high and low pressures and temperatures. It also protects threads from seizing or galling, and permits drawing joints, bolts, and studs tighter than is normally possible.—**Armite Laboratories, 6609 Broad St., Los Angeles 1, Calif.**

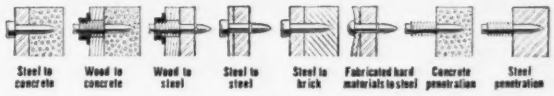
STEEL BRIDGE FLOORING—Structural-plate steel bridge flooring is designed for replacement of wood-plank flooring on highway bridges, viaducts, overpasses, and similar structures. It has a 2-in.-deep trapezoidal corrugated section and a laying width of 33 in. Lengths are standard 6, 8, 10, and 12 ft., and can be fabricated to full roadway width. It is available in 7, 10, and 12 gage for various loading and stringer spacing. Slots are punched to correspond with stringer locations to permit welding plates to the bridge structure.—**United Steel Fabricators, Inc., Wooster, Ohio.**

Hard-Surfacing Alloys—Three new hard-surfacing alloys are available in cast-rod form. Victorite is recommended for use on equipment subjected to abrasion or sliding friction and not subjected to severe impact. Melting point is 2,420 deg. F.; tensile strength, 56,000 psi.; specific gravity, 7.7. Deposits of Victorite average 56 to 60 Rockwell C. It is available in bare or coated, in sizes from ⅛ to ⅜ in. Victor HS-1 is recommended to resist corrosion, heat and attrition at either low or elevated temperatures. It has a 58 to 60 Rockwell C hardness, a 47,000 psi. tensile strength, melting point of 2,230 deg. F., and a negligible elongation. Available, bare or coated, in sizes from ⅛ to ⅜ in. Victor HS-6 is recommended for use where corrosion and elevated temperatures are important factors and where impact is involved. It has a Rockwell C hardness of 45 to 47, a tensile strength of 105,000 psi., a melting point of 2,295 deg. F., and an approximate elongation of 2 percent. Available, bare or coated, in sizes from ⅛ to ⅜ in.—**Victor Equipment Co., 844 Folsom St., San Francisco 7, Calif.**

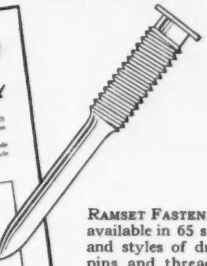
Aluminum-Backed Insulation—Mineral-wool insulation is now provided with a backing of pure aluminum foil. This foil is said to stop 95 percent of all heat transmission by radiation; the rockwool stopping conduction and convection. Seal-Foil is manufactured in a medium thickness of approximately 2½ in.—**Sealtite Insulation Mfg. Corp., 115 Madison St., Waukesha, Wis.**

CORRECTION—The September issue of CONSTRUCTION METHODS AND EQUIPMENT states that "sole distributorship of the Sicard line of Snow Master rotary plows has been granted to the Austin-Western Co. of Aurora, Ill." This should read: Sole distributorship of the plow, *when used as a grader attachment*, has been granted to Austin-Western.

SAVE MONEY, TIME, TROUBLE ON FASTENING JOBS LIKE THESE WITH RAMSET SYSTEM



Ramset Fastening System
Cost comparison sheet for National Company
NO. OF FASTENINGS 150
TIME REQUIRED Present Method 37 HOURS Ramset System 3.7 HOURS
COST AT $2.40 PER HOUR $ 88.80 $ 8.88
COST OF MATERIALS 15.00 36.00
TOTAL COST $103.80 $ 44.88
COST SAVED WITH RAMSET SYSTEM $ 58.92
57 %
SAVED PER FASTENING WITH RAMSET SYSTEM $ .39
TIME SAVED WITH RAMSET SYSTEM 33.3 HOURS
90 %



RAMSET FASTENERS available in 65 sizes and styles of drive pins and threaded studs, made of heat-treated, work-hardened, coated steel.

FIGURE OUT FOR YOURSELF WHAT *Ramset* CAN SAVE!

FASTENING SYSTEM

Select any job of fastening or anchoring into steel, concrete, masonry or other materials as shown above. Then, use RAMSET's free Cost Comparison Sheet to compare slow, laborious, costly chipping and plugging, drilling and tapping with the amazingly fast, simple, economical RAMSET FASTENING SYSTEM.

Thousands of RAMSET users are profiting every day from big savings on their fastening jobs. That's because it takes less than a minute, from start to finish to *"Ramset"* a drive pin or threaded stud, to fasten materials together or to provide an anchor. Just READY! RAM! SET! Quick as lightning, the simple, self-powered, easy-to-use RAMSETTER does the work.

INVESTIGATE RAMSET! Save money on present jobs, slash costs below competition on work you are estimating. *"Ramset"* your way into more business. Ask your local RAMSET dealer or write us for details and free Cost Comparison Sheets.

Stemco Corporation, Cleveland 16, Ohio.

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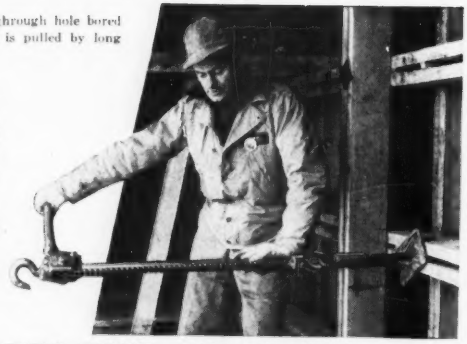
YOU CAN FASTEN FASTER, EASIER, AT LESS COST WITH *Ramset* FASTENING SYSTEM

Threaded tie rod extends through hole bored in base of Hoist-All. Rod is pulled by long nut with welded loop.



COFFING HOIST-ALL *pulls* **FORM RODS** *quickly*

. . . SAVES TIME, MATERIALS

You can save valuable time and steel, eliminate expense of tubes by pulling form tie rods with a Coffing Hoist-All. With base against form, this powerful tool simply hooks onto tie rod, "jacks" it out—quickly, safely. No damage to rods, no tubes left in form, rods are ready to use again. Hoist-All has 44-in. lift, weighs 23 lb., has plenty of "pull" to overcome adhesion of concrete to rods.

It's a Hoist . . . a Jack . . . a Puller

With stand, the Hoist-All is a powerful high-lift jack. Without stand, it's ready for all hoisting, pulling, load binding jobs. "Safety-load" handle protects against overload. Two rugged models—2000 and 4000 lb. capacity. For complete information write for bulletin D12HA.

COFFING HOIST COMPANY, Danville, Illinois

Quik-Lift Electric Hoists — Safety-Pull Ratchet Lever Hoists — Mighty Midget Pullers — Spur-Geared Hoists — Differential Chain Hoists — Load Binders

GREATER YARDAGE! LOWER COST!

WELLMAN *Williams* WELDED BUCKETS

SEND FOR BULLETIN

Wellman Buckets cost less to maintain because they are ruggedly built. They deliver bigger payloads because they are properly designed. The superior engineering in Wellman Buckets gives the operator better balance, easier handling, cleaner digging. Wellman pioneered the unique construction that pays off in greater yardage at lower costs. There's a Wellman Bucket for every service.

THE WELLMAN ENGINEERING COMPANY
7017 CENTRAL AVENUE CLEVELAND 4, OHIO

New PUBLICATIONS From MANUFACTURERS

The catalogs and bulletins reviewed below will keep you posted on latest developments in construction equipment and materials available for your use

FLEXIBLE CHAIN COUPLINGS—Sixteen-page catalog describes a complete line of flexible chain couplings. Subjects covered are: roller-chain stock couplings, silent-chain stock couplings, heavy-duty made-to-order silent-chain couplings, and steel and plastic covers for the two stock couplings. Catalog C45-49 contains dimension data, horsepower ratings, and stock and minimum bores.—**Morse Chain Co., 7601 Central, Detroit 8, Mich.**

POWER-CONTROL EQUIPMENT—Loose-leaf catalog describes panel boards, switchboards, control consoles, gage boards, and other power control equipment. Loose-leaf style permits the insertion of timely data sheets as they are made available. The present edition consists of 11 pp. describing, (besides the equipment listed) the T&C engineering department, list of users of T&C equipment, an example of a typical problem solved by T&C, and other miscellaneous data.—**Taller & Cooper, Inc., 75 Front St., Brooklyn 1, N. Y.**

PRESSURE GAGE—Interesting applications of a mechanical pressure gage are photographically represented in a new bulletin. The Dillon gage is designed to measure mechanical pressures of compressive loads, even in limited space. The folder points out the principal features of the unit and illustrates a dozen ways of using it. This instrument is available in 6 models with capacities ranging from 0 to 5,000 lb.—**W. C. Dillon & Co., 5410 W. Harrison St., Chicago 44, Ill.**

BREAKER WITH AIR-LIFT LEG—Bulletin describes Model 52AJ paving breaker, the feature of which is the utilization of line air pressure to actuate an integral leg to lift the breaker and to free stuck steel. The bulletin illustrates how the air-lift leg operates, and lists the advantages said to accrue through its use. Also listed are specifications and dimensions of the Air-Jac.—**LeRoi Co., 1701 S. 68th St., Milwaukee 14, Wis.**

Amsco®

Chain

THE LINK TO *Lower Costs..*

Because Amsco chain is made of austenitic manganese steel . . . The Toughest Steel Known . . . it is the most durable heavy-duty chain money can buy. With an average test-bar tensile strength of 125,000 lbs., high ductility, and the property of surface work-hardening up to 550 BHN, Amsco chain withstands severe stresses and grinding abrasion . . . and can be used without lubrication in dust-laden atmospheres.

Service records prove the longer wear-life of Amsco chain. One typical report reads "25 months with little wear with Amsco chain versus 8 months before." Another states "27 months, with 2 years' service left, where ordinary chain lasted only 3 months."

For elevating and conveying chain, Amsco longer chain life means important savings in replacement costs and lost production time. Write for full information. Ask for Bulletin 742-CN.

AMERICAN Brake Shoe COMPANY

AMERICAN MANGANESE STEEL DIVISION
CHICAGO HEIGHTS, ILL.

Foundries at Chicago Heights, Ill., New Castle, Del., Denver, Colo., Oakland, Calif., Los Angeles, Calif., St. Louis, Mo. Offices in principal cities. In Canada: Joliette Steel Limited, Joliette, Que.

"WHAT PRICE ABRACADABRA?"

Abracadabra is expensive. Many of you found that out years ago. You practically had to use black magic to figure your costs which were based on truck mixer operation. Indefinite capacities, "outlaw" sizes, rapid changes in ratings—all combined to make abracadabra confusion a big expense.

That's why the Truck Mixer Manufacturers Bureau was formed—to eliminate that costly abracadabra. We set standards which guarantee size and capacity. And we put a rating plate on each truck mixer. The Bureau has taken the mumbo-jumbo out of figuring truck mixer operating costs, and erased the confusion of "outlaw" sizes.

We think you prefer it this way—with established standards and a rating plate to guarantee size and capacity. Look for that plate, and read it with confidence.

2 CUBIC YARD MIXER
GUARANTEED TO HOLD, MIX AND AGITATE ITS RATED CAPACITIES AND CERTIFIED TO COMPLY WITH TRUCK MIXER MANUFACTURERS BUREAU STANDARDS AS APPROVED BY N.R.M.C.A.
3 CUBIC YARD AGITATOR
N.R.M.C.A. REGISTRY No.

Truck Mixer Manufacturers Bureau

Affiliated with The National Ready Mixed Concrete Association

BLAW-KNOX DIVISION
Pittsburgh, Pa.

CHAIN BELT COMPANY
Milwaukee, Wis.

CONCRETE TRANSPORT MIXER CO.
St. Louis, Mo.

THE JAEGER MACHINE COMPANY
Columbus, Ohio

WORTHINGTON PUMP & MACHINERY CORP.
RANSOME DIVISION, Dunellen, N. J.

THE T. L. SMITH COMPANY
Milwaukee, Wis.

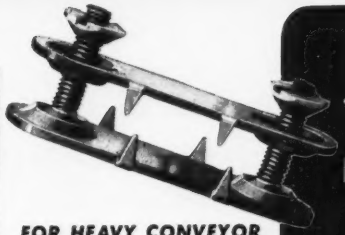
LIGHTWEIGHT PUMP — Bulletin LP-9 describes the Model 1½-AP and Model 2-PAF lightweight pumps. The smaller unit weighs 90 lb.; the larger, 105 lb. Bulletin contains illustrations of these pumps in use, describes their advantages, and lists specifications and dimensions of each. Also listed, is a table of performance characteristics. — **The Jaeger Machine Co., 550 W. Spring St., Columbus 16, Ohio.**

HANDLING SPECIAL STEEL—Methods for forming, joining, and painting Zincgrip-Paintgrip sheet steel is contained in an illustrated 12-p. booklet. This Armco product is a special zinc-coated and bonderized sheet steel which can be formed and drawn like mild steel and can be used for house panels, metal ceilings, tunnel equipment, roofing panels, templates, and other applications. Helpful suggestions are supplied on how to weld, solder, clean, and paint this material.—**Armco Steel Corp., 1049 Curtis St., Middletown, Ohio.**

STANDBY POWER PLANTS—Catalog Sheet No. 449-SB describes the Katolight standby power plants. Listed are seven ac. models with ratings of 3, 4, 5, 7.5, 10, 12.5, and 15 kw. The catalog sheet describes the power units, features of operation, capacities, standard equipment provided with each unit, and accessories available for specialized service.—**Kato Engineering Co., Mankato, Minn.**

WAGON DRILLS—This 12-pager is devoted to three sizes (light, medium, and heavy weight) of wagon drills. An interesting feature of the bulletin is a series of line drawings showing how drilling costs can be reduced with these highly mobile wagon mountings. The illustrations indicate initial equipment savings as well as savings in operating costs. The booklet is well illustrated with photographs of various field applications.—**Joy Mfg. Co., Henry W. Oliver Bldg., Pittsburgh 22, Pa.**

STRONG-SHELL EXTINGUISHER—Data sheets describe complete line of fire extinguishers, feature of which is the use of a silicon-bronze, monotype-construction shell with an ultimate shell strength of 1,400 psi. The data sheets describe various types of extinguishers such as foam, soda-acid, and anti-freeze water types. Each sheet contains information on the operation of the particular type extinguisher, as well as the uses to which each is best suited. The monotype construction is described in detail by captioned illustration.—**American-LaFrance-Foamite Corp., 100 E. LaFrance, Elmira, N. Y.**



FLEXCO

BELT FASTENERS AND RIP PLATES

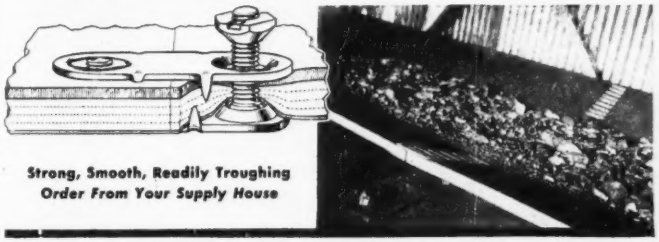
FOR HEAVY CONVEYOR AND ELEVATOR BELTS OF ANY WIDTH

FLEXCO Fasteners make a tight, butt joint of great strength and durability . . . distribute the strain uniformly. Operate smoothly over flat, crowned or take-up pulleys. Made of steel, Monel, Everdur and Promal.

FLEXCO Rip Plates are for repairing and patching damaged belts.

Ask for Bulletin F-100

FLEXIBLE STEEL LACING COMPANY • 4699 Lexington St., Chicago 44, Illinois



Strong, Smooth, Readily Troughing Order From Your Supply House

New!

THE CAP THAT DOES NOT FORGET TO CLOSE

Completely automatic — the "RAINCAP" is counterbalanced to open when the tractor starts and close when it stops. Rust proof—made of cast aluminum—with bronze bushing—can be installed in two minutes. F.O.B. Waterloo, Iowa.

- Immediate delivery
- Liberal Dealer Discount.

STOPS MOISTURE FROM FALLING INTO TRACTOR EXHAUST

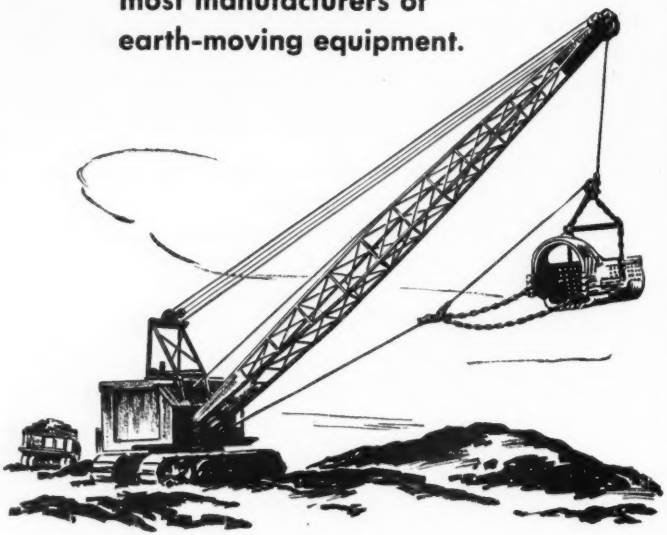
No.	O.D. Exhaust	Retail
1	2⅛"	$1.90
2	2⅜"	1.90
3	2¾"	1.90
5	1⅞"	1.90
55	2"	1.90
5a	1¾"	1.90
6	1½"	1.90
66	1¾"	1.90
7	2½"	1.90
8	3"	2.50
9	3⅛"	2.50
10	3¼"	2.50
11	3½"	2.75
115	3¾"	3.00
12	4"	3.00
123	4⅛"	3.00
125	4¼"	3.00
14	4½"	3.00

Write Dept. CM.

WATERLOO FOUNDRY CO., WATERLOO, IOWA

FIRST WITH MANUFACTURERS . . .

J-M INDUSTRIAL FRICTION MATERIALS are specified as original equipment by most manufacturers of earth-moving equipment.



FIRST WITH OPERATORS . . .

Operators who want to keep maintenance costs low *know* that **JOHNS-MANVILLE FRICTION MATERIALS** are easy to wear in, hard to wear out.

If Johns-Manville materials are right to *start* with . . . they must be right to *stay* with. When you order replacements, remember that Johns-Manville says "stop" and "go" to more tonnage than any other friction materials . . . see your Johns-Manville Friction Materials distributor or write Johns-Manville, Box 290, New York 16, New York.

JM

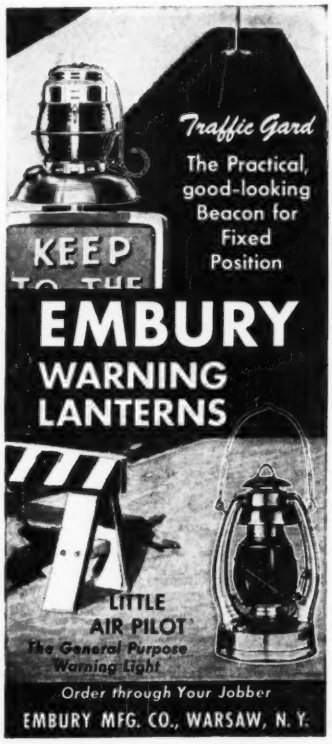
Johns-Manville

INDUSTRIAL FRICTION MATERIALS

No. 1 With Leading Manufacturers

VITRIFIED TILE CONDUIT—Data sheet describes the uses of vitrified tile conduit for steam, oil, and hot water piping. Feature of bulletin is table of typical pipe-carrying capacities of Stillwater steam conduit sectional covering. Bulletin illustrates standard and extra-strength clay pipe, clay pipe fittings, fuel linings, perforated pipe, well pipe, refractory hot tops, wall coping, and liner plates.—**The Stillwater Clay Products Co., 3334 Prospect Ave., Cleveland 15, Ohio.**

COMPRESSOR REGULATOR — Improved regulator for Drill-More Capacity Control of portable compressors is fully described in a new folder. Features of the UL-83 Floating-Speed regulator, explained in detail in the folder, include slowing down of the compressor to lowest practical working speed when less than full capacity is used; compressor capacity is varied throughout the entire speed range without speed steps or cycling; compressor cylinders unload only when the minimum speed delivers more air than needed; and wasteful idling is eliminated. The folder points out that the UL-83 automatically varies the speed by adjusting the engine governor spring. —**Ingersoll-Rand Co., 11 Broadway, New York 4, N. Y.**



ASPHALT-HEATING BURNERS – Low-pressure air-atomizing oil burners for use with asphalt heaters or other heat-processing applications are described in an 8-p. catalog. These burners are designed for burning oil or a combination of oil and gas. Feature of Bulletin No. 409 is a description, accompanied by a cutaway drawing, of the principle of operation of these burners. Tabulated data list capacities and dimensions of the Series B units and valve capacities. Another Bulletin, No. 1063, describes the Hauck portable hopper-car-thawing equipment. Feature of this bulletin is a description of a new model available with a powerful, heavy-duty torch flame heating burner which does not require compressed air or other auxiliary equipment for its operation. — **Hauck Mfg. Co., 124 Tenth St., Brooklyn 15, N. Y.**

SAFETY EQUIPMENT—Catalog of personal protective equipment and industrial safety devices is entitled, "Everything in Safety." It is divided into five sections—First Aid; Respiratory Protection; Eye Protection; Hats, Belts, and Clothing; and Miscellaneous Safety Equipment.—**E. D. Bullard Co., 275 Eighth St., San Francisco 3, Calif.**

BELT CONVEYORS — "Move More for Less" is the title of 32-p. belt-conveyor bulletin. It presents information on stationary, portable and 16 types of special-purpose belt conveyors—both troughed and flat belt. Included are future applications and methods of selection of belt conveyors; dimensions, weights, and specifications for standard head, tail, and intermediate sections; lattice, channel, and timber frames; and terminal machinery. Among the advantages listed in Bulletin 1400 are the use of Life-Sealed ball-bearing idlers, exclusive splice plate which makes frame joints as strong as the rest of the Lippmann lattice section, steel shafts, anti-friction bearings on all terminal machinery, and solid steel pulleys, turned and uniformly crowned. — **Lippmann Engineering Works, 4603 W. Mitchell St., Milwaukee 14, Wis.**

ONE-MAN-OPERATED TRENCHER Bulletin (8 pp.) features a description of the Parsons "80" Trenchmobile. Photographs are used to illustrate the various features of this one-man-operated pneumatic-tire-mounted trencher, as well as to show it in use on a wide variety of trenching operations. Also listed is a table of condensed specifications. The "80" will dig trenches 5 or 8 in. wide, and up to 4 ft. deep.—**The Parsons Co., Koehring Subsidiary, Newton, Iowa.**

Parmanco

MECHANICAL FEED
HORIZONTAL DRILL
WITH TRACTION DRIVE

Ten years of field test has proven that our power-feed design of direct, transmission and worm gearing with two-speed control will not only cut shot hole drilling time in half but also eliminates costly maintenance delays. V-belt drive to the power-feed with an additional ample clutch in that assembly gives absolute control of a drilling speed of two to three feet per minute with a retrieving speed of twenty-four feet per minute.

The Parmanco Horizontal is adapted to all forms of high-wall drilling, will handle a six-inch auger up to a distance of sixty feet or more and, by use of our patented augers with interrupted flights and secondary cutters, will drill an absolutely clean hole with a minimum of torque. It permits the drilling of a controlled-angle hole which makes possible a great saving of explosives through the cantilever effect of this controlled-angle drilled hole.

EFFICIENT STRIPPING STARTS WITH EFFICIENT DRILLING

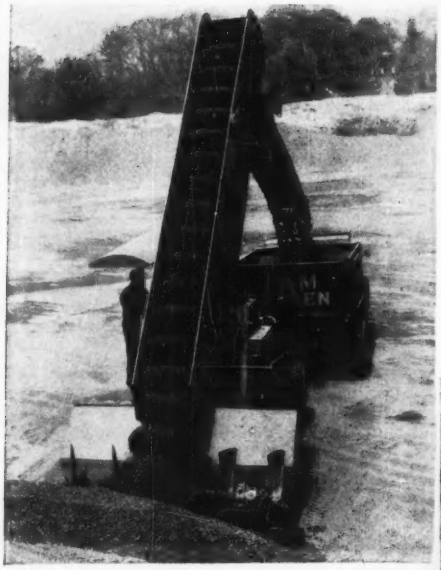
PARIS MANUFACTURING COMPANY
PARIS, ILLINOIS

HAISS

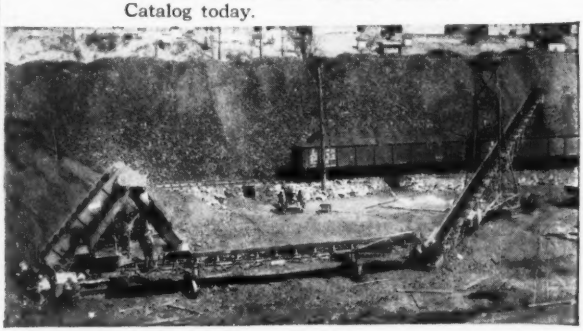
•BUCKET LOADERS

Load 3 To 8 Yards Per Minute

Haiss Bucket Loaders are used for excavating — rehandling — stripping and loading: sand — gravel — stone top-soil — coal and similar materials. Self Propelled, Self Feeding — wheel or crawler mounted — One man operation. Write for Bucket Loader Catalog today.



HAISS LOADER IN ACTION
(Note the full Buckets)



HAISS LOADER and
Conveyors Combination

•CONVEYORS portable or stationary CAR UNLOADERS

HAISS FLAT or TROUGH BELT CONVEYORS
(Model 481 and 482)

For all bulk materials. Mounted on "V" or mast truck with swivel wheels. Ask for Bulletin No. 481 for coal or coke handling—Bulletin No. 482 for sand and gravel, etc.

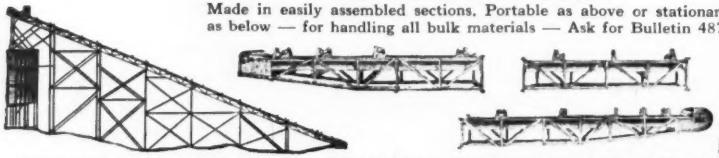
HAISS CAR UNLOADERS
(Models 483 and 484)

Belt and drag types for low-cost undercar unloading from hopper bottom cars. Ask for bulletin No. 483-4.

•BUCKETS

HAISS SECTIONAL CONVEYORS

Made in easily assembled sections. Portable as above or stationary as below — for handling all bulk materials — Ask for Bulletin 487.



EXCAVATING — REHANDLING

Experienced Haiss representatives are located in all principal cities. For further information, write, phone or wire.

GEORGE HAISS MFG. CO., INC. division of **PETTIBONE MULLIKEN CORP.**

141st to 144th St. on Park Ave. NEW YORK 51, N. Y.
Phone Mott Haven 9-3650

4700 W. Division St. CHICAGO 51, ILL.
Phone Spaulding 2-9300

FRAMING ANCHORS—Bulletin explains application of Trip-L-Grip framing anchors in light wood frame construction. Specification Sheet No. 1 illustrates the application of these anchors in attaching joists to headers and headers to trimmers. It identifies the anchor most suitable for each location and shows how it should be installed. The Trip-L-Grip anchors eliminate ledger strips, notching, and toe nailing.—**Timber Engineering Co., 1319 Eighteenth St., N. W., Washington 6, D. C.**

TRUCK MIXER STANDARDS—Second revision (8 pp.) of standards for truck mixers and agitators is now available. These standards cover mixer and agitator units, types, sizes, capacities, drum volume, water measuring device, water and flushing tanks, water pump, hatch, mixing time and speed, agitator speed, and general requirements.—**Truck Mixer Manufacturers Bureau, 1325 E St., N. W., Washington 4, D. C.**

ROAD-EQUIPMENT CATALOG—Lists properties and specifications of the Model PG-10 power grader, the Model 30 maintainer, and accessories for use with them, including front-end loader, crane hook, bulldozer, backfiller, and snow plow. Grader attachments, described in Bulletin No. 144, include cab, blade extension, electric lights, and leaning wheels. Specifications listed for the grader cover dimensions, speeds, controls, blade assembly and range, weights, engine specifications, and construction and operation features. The catalog contains many photographs showing the equipment in use.—**Meili-Blumberg Corp., New Holstein, Wis.**

MACHINE TOOLS—Complete line of machine tools for metal and woodworking operations is listed in a new 16-p. catalog. Four new items, cataloged for the first time, include a 12-in. band saw, 6-in. jointer, 8-in. tilting table saw, and a 9-in. tilting arbor saw. In all, nine types of machines are illustrated. Complete specifications and descriptions are given for each machine.—**Walker-Turner Division, Kearney & Trecker Corp., Plainfield, N. J.**

"GUNITE" CONSTRUCTION—Advantages and applications of "Gunite" concrete are listed in 24-p. catalog. The bulletin is illustrated with photographs showing the method of applying "Gunite," as well as showing several installations in which this method of concrete construction has been used. Uses for "Gunite" include lining, repairing, fireproofing, encasing, waterproofing, insulating, and original construction of concrete-faced structures.—**Gunite Concrete & Construction Co., 1301 Woodswether Road, Kansas City 6, Mo.**

ENGINE-DRIVEN GENERATORS—Four-page folder describes complete line of diesel and gasoline-engine-driven generator sets designed for emergency or continuous service. These sets range in capacity from 5 to 250 kw. Bulletin 112 contains illustrations of ten typical units demonstrating the scope and application of these power plants. The bulletin also contains information on the company, on engine accessories and other equipment, applications, special features, and spare parts and service facilities.—**International Diesel Electric Co., Inc., 13-02 Forty-fourth Ave., Long Island City 1, N. Y.**

MOTORS FROM 1 to 20-HP.—"The Inside Story of Allis-Chalmers 'Safety Circle' Motor Protection" is the title of a new 8-p. bulletin just released by the company. It describes the design and construction features of the 'Safety Circle' motor; lists sizes and range of capacities in which it is available; and contains a detailed description of the various advantages claimed for these electric motors. — **Allis-Chalmers Mfg., Co., 1018 S. 70th St., Milwaukee, Wis.**

The Eighth of a Series in the interest of more efficient use of steel . . . a vital American resource

USE PROPER STEEL STRESSES AND SPECIFY LACLEDE MULTI-RIB REINFORCING BARS

Concrete reinforcing steel design stresses of 20000 psi (f_s) are based upon old type plain bars with 40000 psi maximum yield strength . . . A safety factor of 2 at the elastic limit.

Laclede Multi-Rib Reinforcing Bars designed for high anchorage* are produced in steel grades with more than 60000 psi yield strength. Retaining the elastic limit safety factor of 2, a design stress with Multi-Rib high strength reinforcing of *30000 psi is justified.*

Sound engineering design dictates efficient use of materials . . . so why waste every third bar?

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**IN EXCESS OF ASTM A305 REQUIREMENTS AND THE LATEST A.C.I. RECOMMENDATIONS.*

LACLEDE
Producers of Construction Steel

LACLEDE STEEL COMPANY
St. Louis, Mo.

"It's *yardage* that counts! And my MICHIGAN has convinced me that you don't always need a big dipper to get big yardage. No matter what I put her on—sand, gravel, clay, rock—that baby *really* goes to town! Gets out more yardage per hour than any shovel that size I've ever owned. She crowds and swings fast, and dumps fast and clean. When anyone says truck shovels to *me*, I say, 'my *next* one's a MICHIGAN, too!' For the best 'buy' in a truck shovel, get a MICHIGAN!"

Write for Bulletin 100—
"On the Job With MICHIGAN"

DID YOU KNOW you can buy a brand new **MICHIGAN TRUCK CRANE** complete with chassis for as little as $10,250 F.O.B. factory?

MICHIGAN

MICHIGAN POWER SHOVEL COMPANY
495 SECOND STREET, BENTON HARBOR, MICHIGAN, U.S.A.

SALES AND PARTS SERVICE

A department devoted to manufacturers' activities involving the sale and distribution of products and parts, and service facilities. Designed to give the reader information that will enable him more readily to purchase products and parts and to service his equipment.

New Sales Outlets

(Agencies, Branches)

United States Plywood Corp., New York, N.Y.: 29th warehouse in storage and merchandising program opened at 3508 E. Riverside Ave., Spokane, Wash. Contains 6,000 sq.ft. of floor space and 400 sq.ft. for business and sales offices. Will facilitate distribution of weldwood and associated products, according to J. A. Staley, warehouse manager.

Koppers Co., Inc., Pittsburgh, Pa.: Coal tar roofing materials made available west of the Rocky Mountains following expansion of distribution facilities to the Pacific Coast and the addition of sales personnel in Los Angeles and San Francisco. Directing Koppers' roofing sales on West Coast are G. C. Stephenson and S. J. Katz.

Protective Papers, Inc., Union, Ill.: Has appointed Donald's, Inc., Portland, Ore., as sales representatives for Leatherback all-purpose building paper in eleven Western States. Sales offices are also located in San Francisco, Seattle and Salt Lake City.

Osgood Co. and **General Excavator Co.**, Marion, Ohio: Equitable Equipment Co., 410 Camp St., New Orleans, La. Line includes power shovels and materials handling equipment from ⅜- to 2½-cu.yd. capacity.

New Plants or Offices

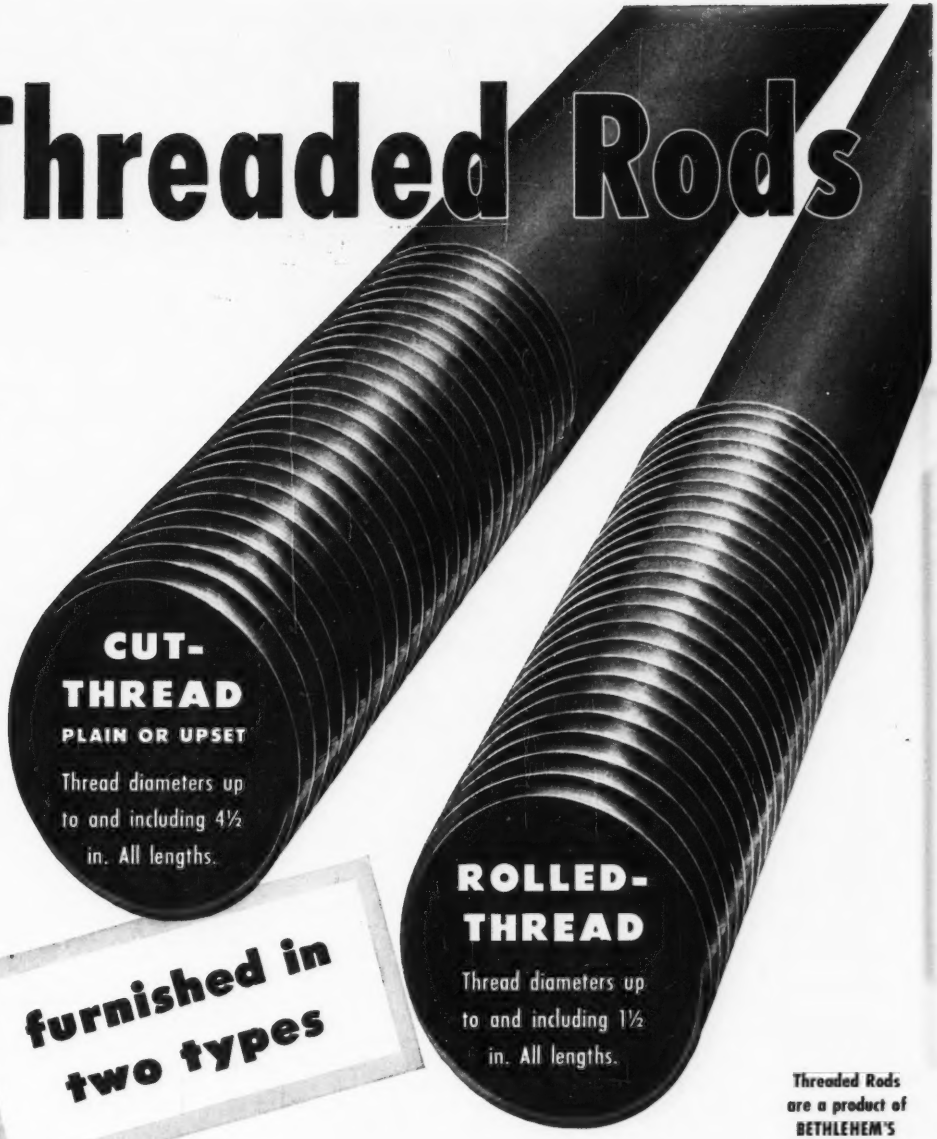
John A. Roebling's Sons Co., Trenton, N.J.: New office and warehouse opened at 3253 Fredonia Ave., Cincinnati, Ohio; W. K. Hanna, formerly head of Pittsburgh branch, will serve as manager.

Mack Trucks, Inc., New York: New territorial sales unit, to be known as the Southwestern Division, established with headquarters in Dallas, Texas; heading new sales division is D. C. Wheeler, recently elected a vice-president of the company.

Minneapolis-Honeywell Regulator Co.: A one-story building containing 102,000 sq. ft. has been bought in Minneapolis to accommodate expansion made necessary by stepped-up

(Continued on page 132)

Threaded Rods


CUT-THREAD
PLAIN OR UPSET
Thread diameters up to and including 4½ in. All lengths.
ROLLED-THREAD
Thread diameters up to and including 1½ in. All lengths.

furnished in two types

Threaded Rods are a product of BETHLEHEM'S LEBANON, PA., PLANT

Bethlehem Threaded Rods can be furnished with turnbuckles, clevises, nuts or other accessories. They come straight or bent, in single or multiple units, asphaltum-dipped or hot-dip galvanized. Prompt deliveries are the rule. Get in touch with us for details.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.
On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation
Export Distributor: Bethlehem Steel Export Corporation

BETHLEHEM STEEL

Bethlehem supplies every type of Fastening

Higher Labor Efficiency!

LOWER JOB COSTS!

with the HERMAN NELSON Standard Model Portable Heater

Completely Self-Contained and Self-Powered

- Gasoline Engine Powered — uses gasoline for heating fuel.
- Provides Quick, Clean, Safe Heat — without smoke, soot or open flame!
- Abundant Fresh, Heated Air — forced to areas where most needed!
- Full 250,000 BTU per hour capacity — enough to heat three ordinary five-room houses — yet no bigger than a kitchen stove!
- Lowers winter job costs by eliminating cold weather shut-downs!
- Can be used for countless applications requiring a portable, self-contained heating unit.

ALSO AVAILABLE! HERMAN NELSON KEROSENE BURNING MODELS

HERMAN NELSON DE LUXE MODEL PORTABLE HEATER with Automatic Temperature Control. Easily operated — set thermostat just like in your own home! Electric Motor Powered — Automatic Ignition — 250,000 BTU per hour.

HERMAN NELSON ECONOMY MODEL PORTABLE HEATER—Low priced, small, compact—ideal for smaller jobs. Electric Motor Powered — 125,000 BTU per hour.

Write for information about temporary or semi-permanent heating.

THE HERMAN NELSON CORPORATION MOLINE ILLINOIS

SINCE 1906 MANUFACTURERS OF QUALITY HEATING & VENTILATING PRODUCTS

(Continued from page 130)

activity of the company's special products division. More than 300 employees are being transferred to the new location at 1433 Stinson Boulevard. The building was bought from Champion Motors Co. M. P. Fedders has been promoted to plant manager of the special products division.

American Vermiculite Corp., New York: New plant utilizing South African vermiculite ore is nearing completion in New Orleans, La.

Graver Water Conditioning Co., New York: Has established new sales and field engineering offices in Cleveland, Ohio (Hippodrome Building) and in Philadelphia (Commercial Trust Building). The Cleveland office is in charge of Herman Ross and the Philadelphia office is headed by Robert Schenker.

Masonite Corp., Chicago: New plant to produce wood fiber hardboard is under construction at Ukiah, Calif.

Kaiser Industries, Inc.: Currently completing design and construction of additional facilities at Kaiser steel mill at Fontana, Calif., estimated to cost approximately $35,000,000. Other projects recently finished or nearing completion include installation of wire and cable-making equipment costing $4,500,000 at the Permanente metals aluminum mill, Newark, Ohio, and a new $2,000,000 porcelain enameling plant for Kaiser Metal Products, Inc., at Bristol, Pa. Expansion work at the Fontana steel plant includes installation of a second 1200-ton capacity blast furnace, 45 additional coke ovens, an 86-in. hot strip mill and an electric resistant pipe welder.

Pittsburgh Plate Glass Co., Pittsburgh, Pa.: Expects to sign contracts for construction of a $1,250,000 paint plant at Torrance, Calif. The plant should be ready to go into production within twelve months. A full line of Pittsburgh house, industrial and automobile paints will be produced at the Torrance plant.

Link-Belt Co., Chicago: Has opened modern new manufacturing plant on 10-acre plot of ground at 3203 South Wayside, Houston, Tex. New plant comprises 45,000 sq. ft. of floor space and is in charge of Allan Craig, general manager of the company's Southwestern Division.

Socony Vacuum Oil Co., New York: Construction of a new plant for handling and filling cylinders of bottled gas is under way in Burlington, Vt. New one-story steel and masonry structure will have immediate capacity of approximately 100 cylinders a day of Mobile-flame bottled gas.

United States Steel Corp., New York: Houston, Tex, has been chosen as the

site for a new electric welded steel pipe mill to be built by the Consolidated Western Steel Corp. New facilities expected to be in operation in the spring of 1950 will provide an annual capacity of 100,000 net tons of 24-in. dia. and larger electric welded and expanded steel pipe.

Tractor & Equipment Co., Chicago: Foundations started for new plant on the southwest edge of Chicago.

Patent Scaffolding Co., Long Island City N. Y.: Has opened new office and warehouse at 1516 Scovill Ave., Cleveland, Ohio, to provide fast and efficient scaffolding service in Cleveland area; M. O. Mertz will be in charge.

Kaiser Metal Products, Inc., Oakland, Calif.: Has completed new $2,000,000 enameling plant in Bristol, Pa., following change in name of Kaiser Fleetwings, Inc., to Kaiser Metal Products, Inc. Change of name marks extensive conversion program which has taken firm entirely out of manufacture of aircraft components and into the production of consumer goods and automobile parts.

Armco Steel Corp. and A. O. Smith Corp.: Announce formation of A. O. Smith Corp. of Texas which will build and operate a plant in Houston for manufacture of welded steel pipe from 8⅝ to 30 in. dia., or larger. Sheffield Steel Co., Armco subsidiary in Houston, will be enlarged to supply steel for operating the new plant.

Distributor Appointments

Colonial Electric Products Co., East Paterson, N.J.: Juan Martinez Zela, Inc., of San Juan, Puerto Rico, named Puerto Rican distributor. Products include cold cathode lighting equipment.

Sales Personnel

Gar Wood Industries, Inc.: W. S. Blakeslee, Jr. appointed assistant general sales manager. R. J. Nymberg appointed manager of Wayne Division, succeeding Mr. Blakeslee.

Asphalt Institute, New York, N.Y.: Arvin S. Wellborn, formerly with Navy Bureau of Yards and Docks, appointed managing engineer of Institute's Pacific Coast Division with offices in San Francisco, Seattle and Los Angeles.

Hyster Co., Portland, Ore.: Recent personnel changes include the following: John Mitchell promoted to district manager of truck sales for northeastern territory; John Cusick named lift-truck sales district manager for central territory. Also appointed district managers are: W. J. O'Brien for southwestern territory,

(Continued on page 135)

Continental Warehouse Service Helps You Keep the Job Moving!

When you need suction hose in a hurry, consider the advantages of Continental's near-at-hand branch warehouse facilities. These factory warehouses, listed below, carry large stocks of hose for every requirement. They're located within reasonable telephone and delivery range. In short, they're equipped and situated to give the prompt, dependable service that helps you keep the job moving—that protects your profit in a job. Get acquainted *now* with Continental Warehouse Service.

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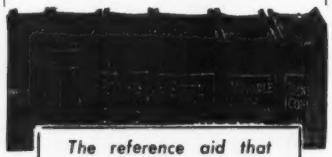
Buffalo, N. Y.	Hartford, Conn.	Memphis, Tenn.	Rochester, N. Y.
Chicago, Ill.	Indianapolis, Ind.	Milwaukee, Wis.	St. Louis, Mo.
Cincinnati, Ohio	Kansas City, Mo.	New York, N. Y.	San Francisco, Calif.
Cleveland, Ohio	Lancaster, S. C.	Philadelphia, Pa.	Syracuse, N. Y.

Save time and money on construction jobs



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With the construction work that lies ahead for every engineer, it is only up to you to assure yourself of superior workmanship—ensure your work of the finest structural qualities—by providing yourself with this revision of the famous Hool and Kinne Library—the books which for years have been providing structural engineers with the facts they need on every problem concerned with the design and construction of civil engineering structures.

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Structural Engineers' Handbook Library

Revised by R. R. ZIPPRODT,

and prepared by a staff of sixty-three well-known engineers, each a specialist in his field

6 volumes; 3763 pages; 2719 illustrations; 63 contributors

Each one of these six volumes is a complete reference in itself on some aspect of structural engineering. The library

- **COVERS** the how and why of foundation and substructure design and construction, the general theory of structural members, the detailed design of such members and the design of their connection with other members.
- **EXPLAINS** the principles of statics, reactions, moments and shears in beams and trusses, influence lines, methods of computing stresses in lateral trusses and portal bracing.
- **GIVES** details of design and construction of steel, timber and concrete structures of all types.

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We invite you to inspect these books for yourself, because we know that that is the one way you can realize their true value to you, and to the jobs that you do. You want to back up your own knowledge with sure, easy-to-get facts, and you want to make your workmanship worthy of your best time and effort. Therefore, the best investment you can make is to add to your own experience the tested working aids given in this dependable reference library.

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Waterproof with Formula No. 640

A clear liquid which penetrates 1" or more into concrete, brick, stucco, etc., seals—holds 1250 lbs. per sq. ft. hydrostatic pressure. Cuts cost; applies quickly—no mixing—no cleanup—no furring—no membranes. Write for technical data—free sample.

HAYNES PRODUCTS CO., OMAHA 3, NEBR.

NEW ADVERTISEMENTS

received by December 21st will appear in the January issue, subject to space limitations.

Address copy to the Classified Advertising Division
CONSTRUCTION METHODS & EQUIPMENT
330 West 42nd St., New York City 18, N. Y.

SEARCHLIGHT SECTION

(Classified Advertising)

EMPLOYMENT: BUSINESS: **"OPPORTUNITIES"** EQUIPMENT: USED OR RESALE

UNDISPLAYED —RATES— DISPLAYED

$1.20 per line, minimum 4 lines. To figure advance payment count 5 average words as a line.

Individual Employment Wanted undisplayed advertising rate is one-half of above rate, payable in advance.

Box Numbers—Care of publication New York, Chicago or San Francisco offices count as one line.

Discount of 10% if full payment is made in advance for 4 consecutive insertions.

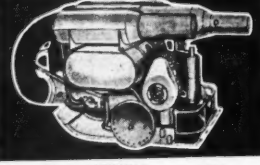
Individual Spaces with border rules for prominent display of advertisement.

The advertising rate is $9.50 per inch for all advertising appearing on other than a contract basis. Contract rates quoted on request.

An advertising inch is measured ⅞" vertically on one column, 3 columns—30 inches—to a page.

New Advertisements received by December 21st will appear in the January Issue. C.M.

HEAT PORTABLE HEATER SALE!



100,000 BTU PORTABLE
HEATER and DRYER

Stewart - Warner portable, powerful 100,000 BTU gas oline-burning Heaters, with Turbine type blowers; 1½ hp. air-cooled, ball-bearing engine; 3 ducts (45-ft. total). IMMEDIATE DELIVERY.

SALE PRICE $195.00

Excellent Operating Condition **Guaranteed**

HEATING buildings, shops, sheds, barns, warehouses, tunnels, bldgs. under construction, spot-heating, etc.

DRYING plaster, paint, grains, mortar, concrete. Torrid blasts of heat.

PRE-HEATING engines, tractors, trucks, equipment, etc.

THAWING frozen areas, machinery, pipelines, tanks, etc.

- VAST QUANTITY OF REPLACEMENT PARTS
- Also SERVICE MANUAL & PARTS CATALOG

PHONE COLLECT—your Heater can be shipped within 2 hours, or, SEND FOR LITERATURE

BERNSTEIN BROS.
MACHINERY CORPORATION
Phone 8404 • "Since 1899" • PUEBLO, COLO.

FOR SALE

Gar Wood 5 Ton Crane with 26' collapsible boom mounted on 1934 Walter Snow Fighter. Equipment in excellent condition. Will sacrifice for $5250. Contact

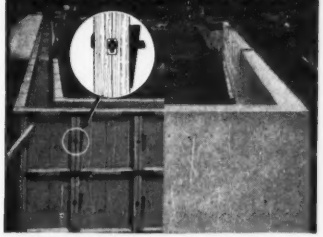
WESTPORT MARINE & SEAPLANE BASE, INC.
WESTPORT, N. Y.

WANTED

WANTED
TRAILERS GOV'T SURPLUS M-19
45 ton Tank Trailers
with or w/o dollys
J. E. INGRAM EQUIPMENT CO.
P. O. Box 2340, San Antonio, Texas

IF THERE IS
Anything you want
that other readers of this paper can supply
OR—
Something you don't want
that other readers can use, advertise it in the
SEARCHLIGHT SECTION

SYMONS
FORMING SYSTEM



SAVES TIME

Inset shows how Symons System saves time in erecting and stripping forms. Bolt passes through 2 x 4 studs and tie loop. Wedge secures the assembly. This simple device cuts forming time 50%.

SAVES LABOR

Harry G. Dehring, Foreman, Taylor Brothers, South Bend, Ind., states "Seven men set up the forms for a 26' x 27' foundation in one hour and fifteen minutes."

SAVES COST

With Time and Labor cut in two . . . Plus savings in nails, spreaders, walers and bracing . . . Plus far greater reuse of forms . . . Costs drop to a new low.

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548 Indiana Street,
HAMMOND, INDIANA

GRIFFIN WELLPOINT CORP.
881 EAST 141st ST. • NEW YORK 54, N. Y.
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(Continued from page 133)

C. E. Houston for northwestern territory, and Fred Schultz for south eastern territory.

Chain Belt Co., Milwaukee, Wis.: Organizational changes include election of William J. Sparling as vice president and manager, chain and transmission division; E. P. Meyer named works manager and Roscoe O. Byers appointed factory manager.

Atlas Mineral Products Co., Mertztown, Pa.: A. Myles Younger elected vice-president in charge of sales.

Mack Trucks, Inc., New York: W. J. Fredrick named manager of company's Newark (N. J.) branch and G. F. Zeller manager of New Brunswick (N. J.) branch.

Truscon Laboratories, Detroit, Mich.: Edward A. Pearson appointed manager of New York City factory branch with offices at 787 First Ave. He will supervise sales of maintenance products to industry and contractors and paints through retail outlets.

Pacific Car & Foundry Co., Renton, Wash.: Steve Drovetto appointed field representative for California and Southwest handling Carco line of tractor winches.

Weco Equipment Co., North Hollywood, Calif.: Robert L. Wicker has become a general partner in the firm which distributes Wood road mixers and other Wood construction equipment.

Worthington Pump & Machinery Corp., Harrison, N.J.: John S. Bachman appointed sales manager, Ransome Construction Equipment Sales Division, located at Dunellen, N.J.; Mr. Bachman succeeds William F. Lockhardt, resigned.

Four Wheel Drive Auto Co., Clintonville, Wis.: W. G. Klaus appointed office sales manager and G. F. DeCoursin field sales manager.

Portland Cement Association, Chicago: Miles D. Catton has been appointed director of development. The work of his department will be directed toward the development of new products and processes and to new and improved uses of portland cement and concrete.

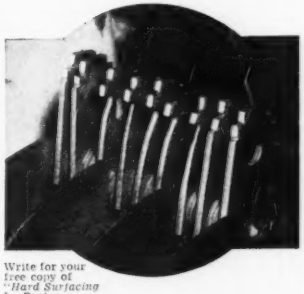
Production

Kaiser Steel Corp., Oakland, Calif.: On October 12, Kaiser steel plant at Fontana, Calif. "blew in" second blast furnace. Operation increases Fontana's pig iron capacity to 2,400 tons a day. New blast furnace was completed in less than ten months under supervision of Kaiser engineers. Blowing-in of second blast furnace doubles potential pig-iron capacity of West Coast.

FOR HARD FACING AND REPAIR

Amsco®
WELDING PRODUCTS

TUNGSITE
Tungsten Carbide
INSERTS



Write for your free copy of *"Hard Surfacing by Fusion Welding."*

FOUR WEEKS—*instead of only four days*—now that these hammers are tipped with Amsco Tungsite Inserts! Imagine how this 600% longer hammer life, with its reduction in machine repair and down time, has cut the costs of pulverizing asphalt roofing trimmings.

Amsco Tungsten Carbide welding products are available as Inserts . . . or as Tungrod and Tube Tungsite hardfacing rods and electrodes. To meet all job needs . . . Inserts are available in a wide range of shapes and sizes . . . and Tungrod and Tube Tungsite are supplied in a variety of mesh sizes. Recommended for resistance to extreme abrasion, or when a serrated cutting edge is required. Outstandingly successful on rotary drill bits, plowshares, cane knives, muller plows, pug mill knives, hammermill hammers and similar parts.

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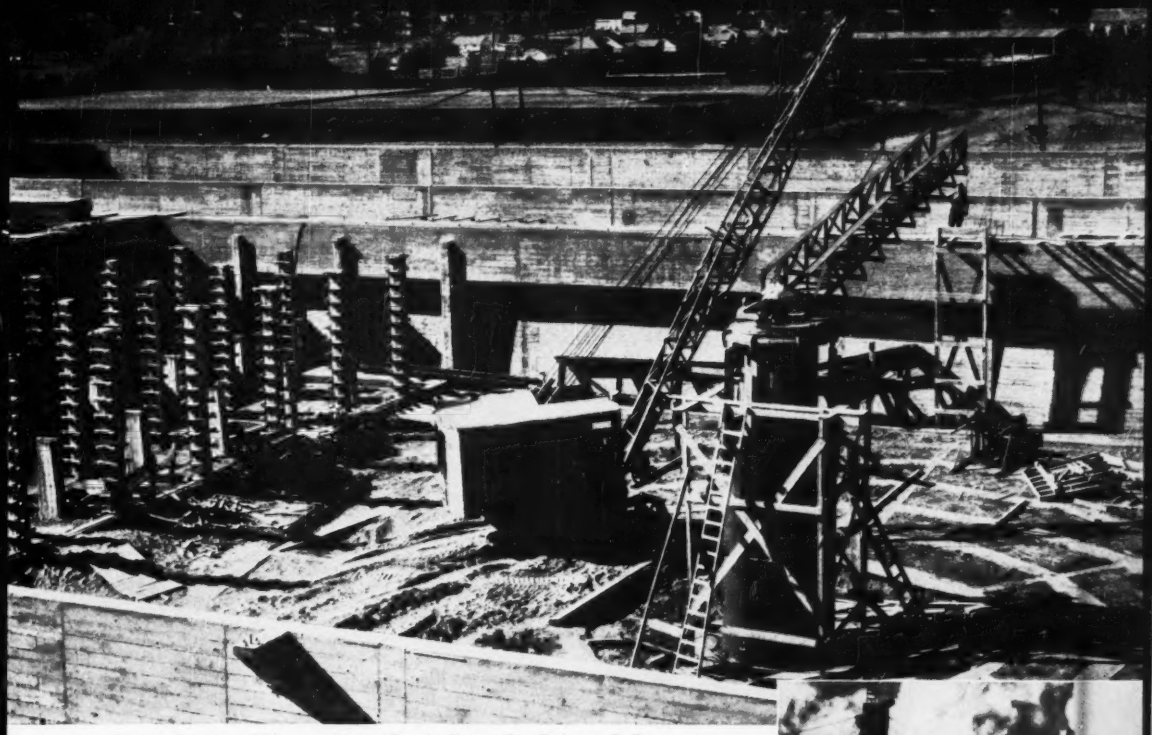

Filtration Plant, City of Edmonton, Alberta, Canada Engrs.—City Engineers Staff,
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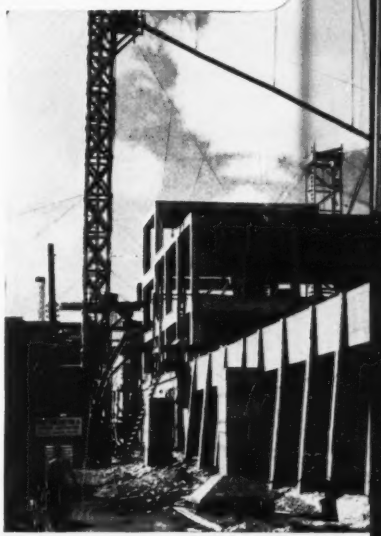

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Good workability resulted in easy placing; reduced water provided minimized shrinkage, increased watertightness and great durability

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CLEVELAND 3, OHIO TORONTO, ONTARIO

How 40 TIMKEN® bearings help do a smooth job on the road

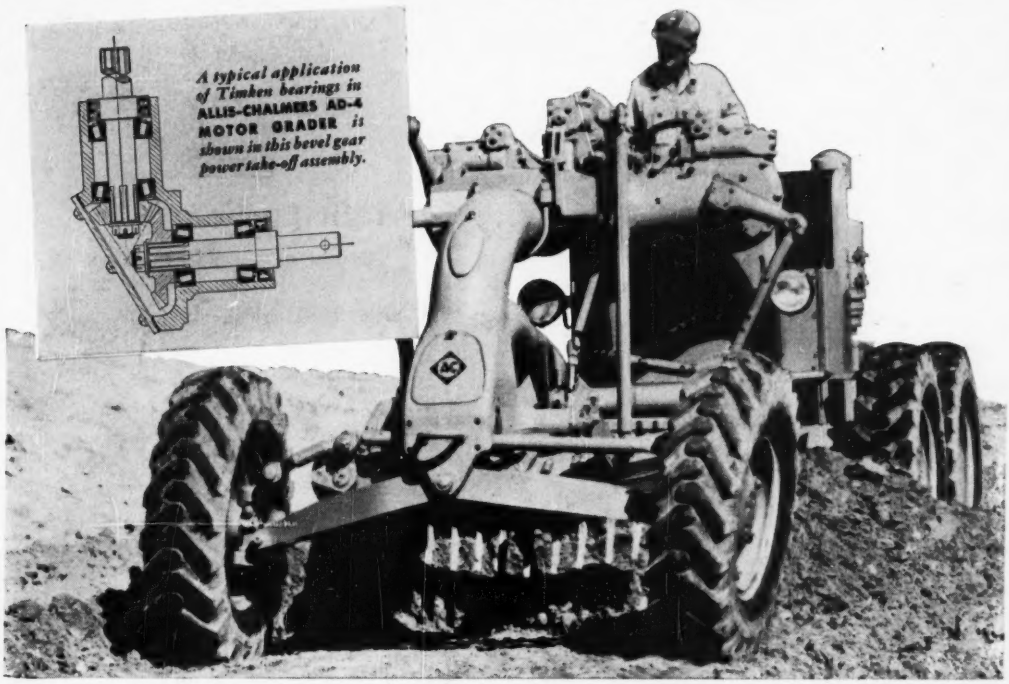
THIS Allis-Chalmers AD-4 Motor Grader, built for heavy construction duty, assures long, trouble-free performance with 40 Timken® bearings holding gears and shafts in proper alignment, reducing wear, and helping to prevent breakdowns. Maintenance is easier and cheaper, too.

Timken bearings are made from Timken fine alloy steel—the best ever developed for roller bearings. They normally last the life of the machine. Due to line contact between the rolls and races, Timken bearings have extra load-carrying capacity, even under the toughest loads. Their true rolling motion and incredibly smooth surface finish enable them to operate freely and frictionlessly. Their tapered construction carries any combination of radial and thrust loads.

Because Timken bearings permit tighter closures, lubricants are kept in—dirt and moisture kept out, reducing maintenance man-hours and materials.

No other bearing can give you *all* the advantages you get with Timken bearings. Backed by 50 years of bearing research and development, they're first choice throughout industry. Use them in all the machinery you build—look for them in the machinery you buy. Be sure the trade-mark "Timken" is on every bearing. The Timken Roller Bearing Company, Canton 6, Ohio. Cable address: "TIMROSCO".

This symbol on a product means its bearings are the best.


A typical application of Timken bearings in ALLIS-CHALMERS AD-4 MOTOR GRADER is shown in this bevel gear power take-off assembly.

NEW TIMKEN BEARING CUTS RUN-OUT IN HALF!

Until now, the Timken "Zero" bearing has been the last word in bearing accuracy. Now Timken offers industry the "Double-Zero" bearing—*twice as accurate* as the "Zero"! Maximum run-out of the new "Double-Zero" bearing is only 75 millionths of an inch—*half* the 150 millionths run-out of the "Zero" bearing.

What an opportunity for manufacturers of machines where extreme accuracy is essential! Available in standard single row types, up to 10" O.D. Write for further information.

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CONSTRUCTION METHODS AND EQUIPMENT

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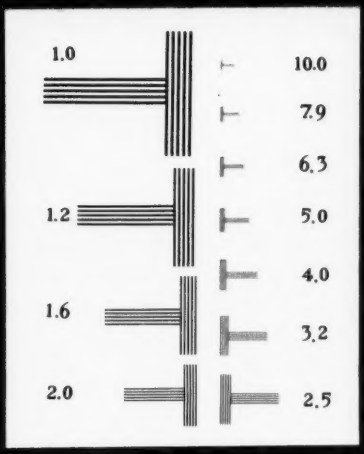
UNIVERSITY MICROFILMS
ANN ARBOR, MICHIGAN. 1951

RESOLUTION CHART



100 MILLIMETERS

INSTRUCTIONS Resolution is expressed in terms of the lines per millimeter recorded by a particular film under specified conditions. Numerals in chart indicate the number of lines per millimeter in adjacent "T-shaped" groupings.

In microfilming, it is necessary to determine the reduction ratio and multiply the number of lines in the chart by this value to find the number of lines recorded by the film. As an aid in determining the reduction ratio, the line above is 100 millimeters in length. Measuring this line in the film image and dividing the length into 100 gives the reduction ratio. Example: the line is 20 mm. long in the film image, and $100/20 = 5$.

Examine "T-shaped" line groupings in the film with microscope, and note the number adjacent to finest lines recorded sharply and distinctly. Multiply this number by the reduction factor to obtain resolving power in lines per millimeter. Example: 7.9 group of lines is clearly recorded while lines in the 10.0 group are not distinctly separated. Reduction ratio is 5, and $7.9 \times 5 = 39.5$ lines per millimeter recorded satisfactorily. $10.0 \times 5 = 50$ lines per millimeter which are not recorded satisfactorily. Under the particular conditions, maximum resolution is between 39.5 and 50 lines per millimeter.

Resolution, as measured on the film, is a test of the entire photographic system, including lens, exposure, processing, and other factors. These rarely utilize maximum resolution of the film. Vibrations during exposure, lack of critical focus, and exposures yielding very dense negatives are to be avoided.

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